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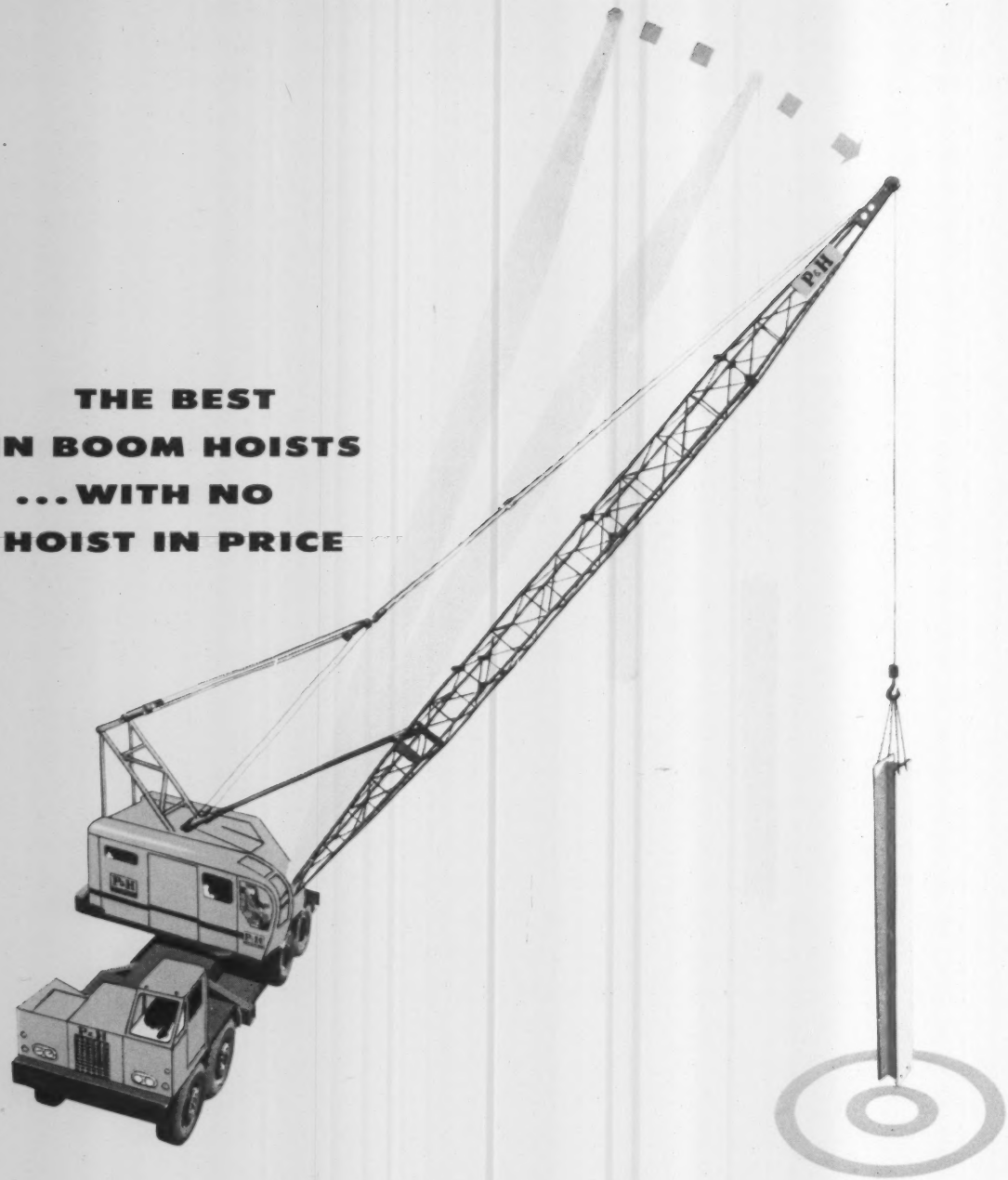

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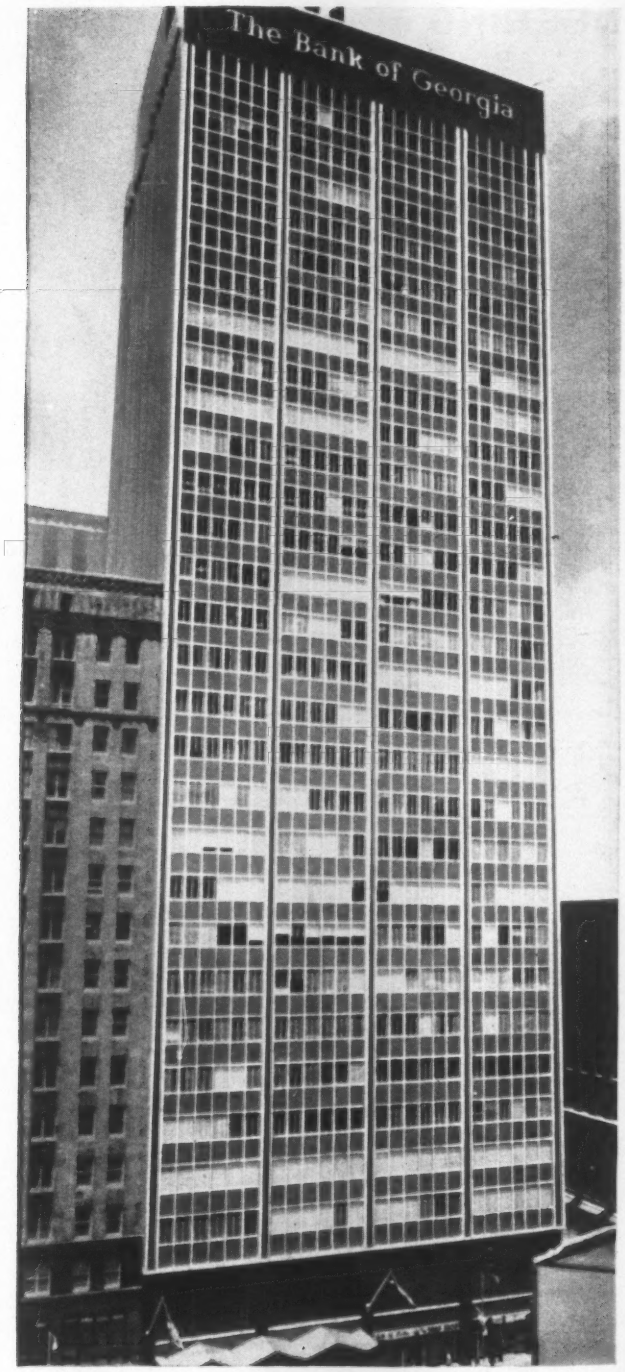

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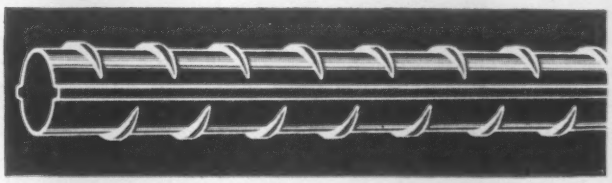

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EIGHTY SEVENTH YEAR OF PUBLICATION

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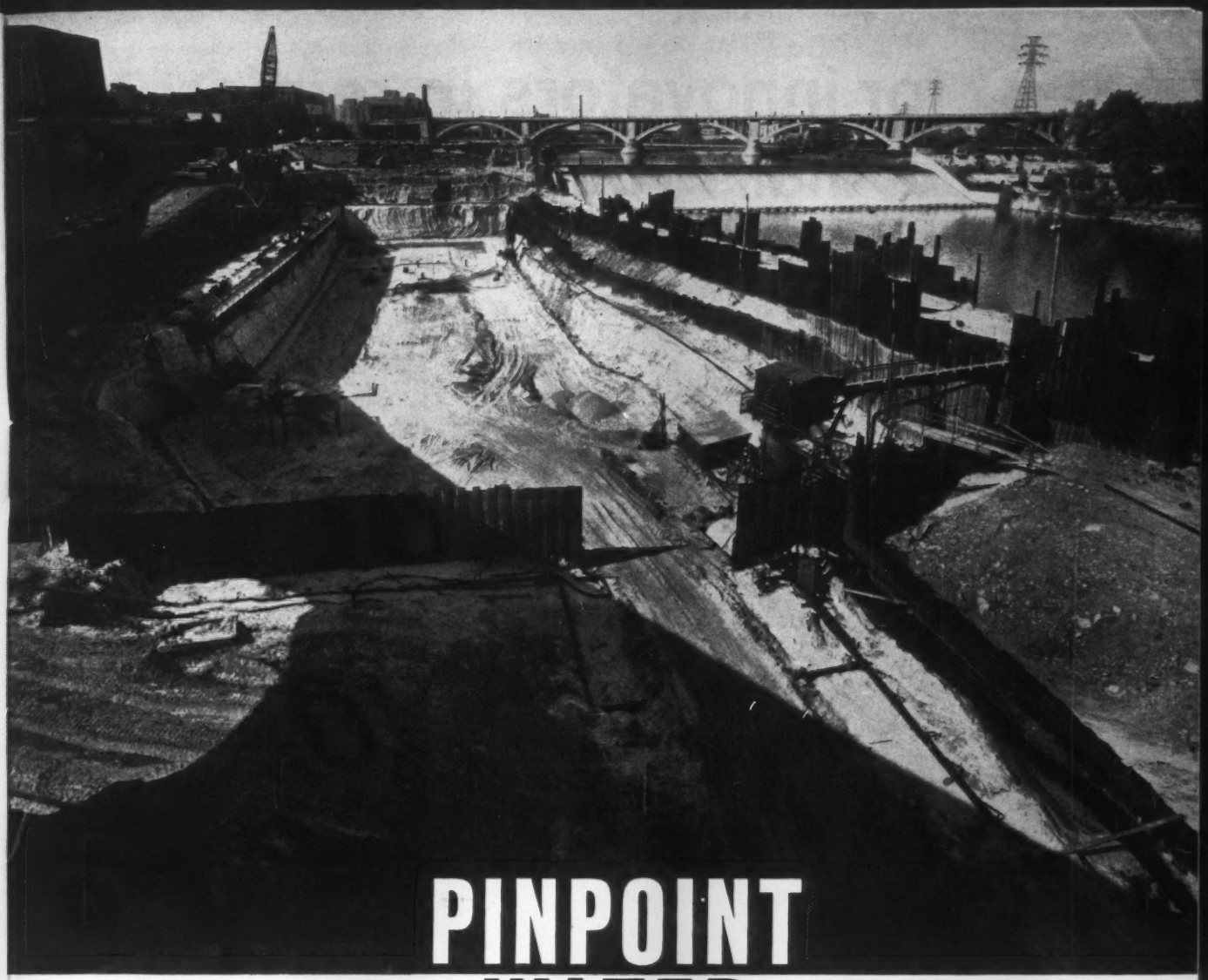

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United Air Lines new base at Chicago's O'Hare Field

Symons Forms Used to Pour Reservoir

Standing out prominently among the airport improvements at Chicago's O'Hare Field is that sector of the field in which United Air Lines constructed a new $4,645,000 base. Concrete pouring was under the direction of superintendent Fritz Washburn of Wm. E. Schweitzer Construction Company, Evanston, Illinois. Washburn and his crew used Symons Forms—many of the forms had been re-used 40 times. The job, a Reservoir 200' long by 58' wide by 17' high. Approximately 1/3 of the walls were poured in one operation. The entire hangar is resting on a 2'9" base pad which was also poured with Symons Forms. Two cross walls were 58' long. Schweitzer used a total of 8000 square feet of Symons Forms to pour approximately 384 cubic yards of concrete.

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CORROSION?
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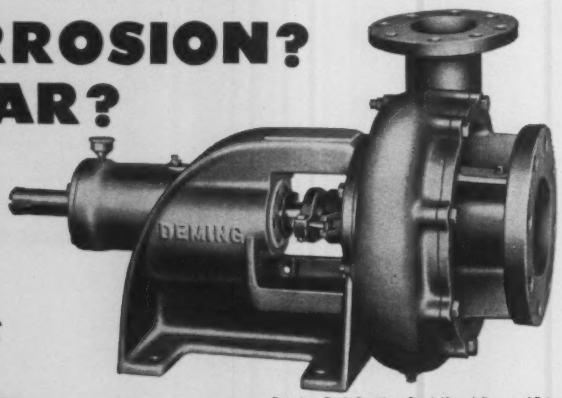

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Reader Comment

No Virtue in Circles

SIR—After reading Hospitals Adopt Clover-Leaf Plan (ENR Nov. 2, p. 47), I am glad you are not as gullible in engineering subjects as you are in hospital planning. You sure swallowed this one hook, line and sinker.

It is bad enough to claim virtues for the cylindrical shape, but it is worse to claim these virtues for the clover-leaf arrangement.

Just take a good look and you will see that 10 out of 22 patients have to glare at each other across a narrow court or pull down the shades. Four more have the choice of looking into the distance or playing peekaboo. In any case, there is nothing worth looking at in the several corners that the composition brings about.

The three-bed room has its window askew, too small and too far to do the job and certainly there is no view from the bed.

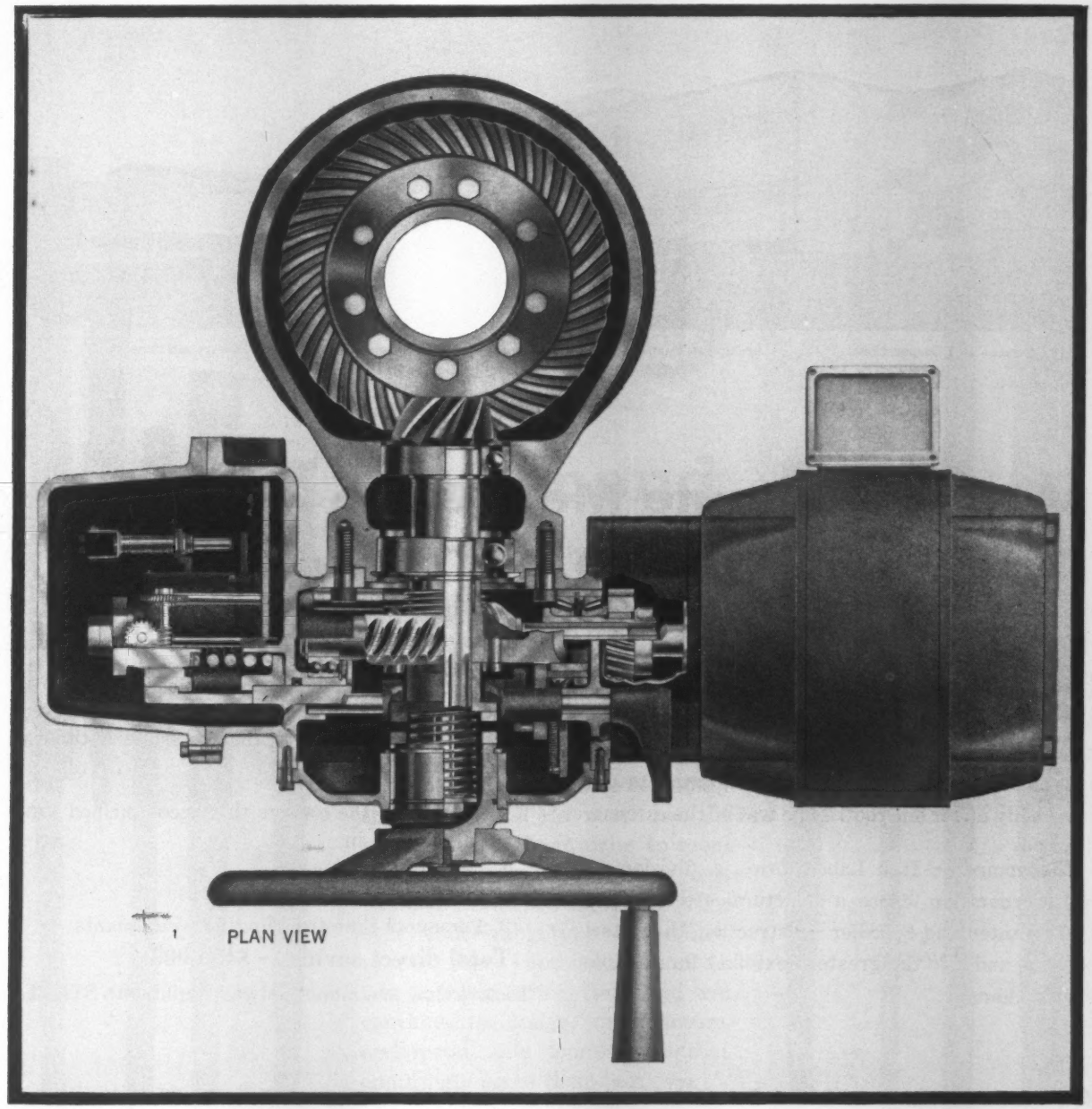
The circular shape has nothing to recommend it. Twenty-two beds per unit is too small to be administratively economical and to raise the number, the radius would need to be so enlarged that the nursing station would begin to acquire the proportions of a dance hall. It has more floor space than necessary even now. It is obvious from the photograph that the nurse sitting in the station could not see the patients.

The Minnesota study concludes that, from a nursing point of view, there are no tangible advantages in the circular shape over a rectilinear one. We also doubt whether the nurses' station as shown could accommodate all the necessary services. Patient examination and treatment, preparation of medications, handling smelly or contaminated items taken from the patient's room could not be performed in open space.

Designers of the circular nursing unit usually claim that it costs much less to construct than a rectilinear one. This is a likely story to tell a client, but ENR readers will know from just looking at the shape that it would be more costly than the rectilinear shape of comparable area. Furthermore, Herbert P. McLaughlin, writing in MODERN HOSPITAL (May, 1961) shows that he can accomplish more in a smaller rectilinear space than a circular space. Jane Jacobs writing in the ARCHITECTURAL FORUM

(Reader Comment continued p. 12)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.



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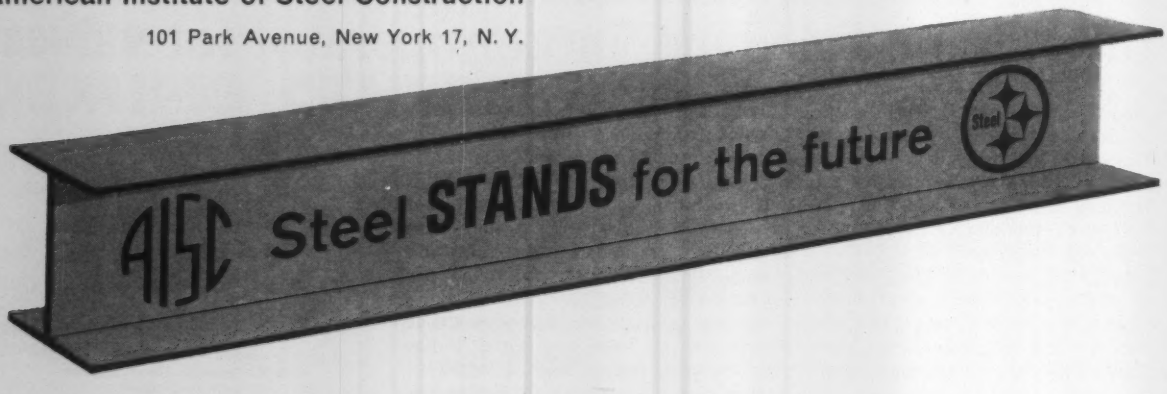

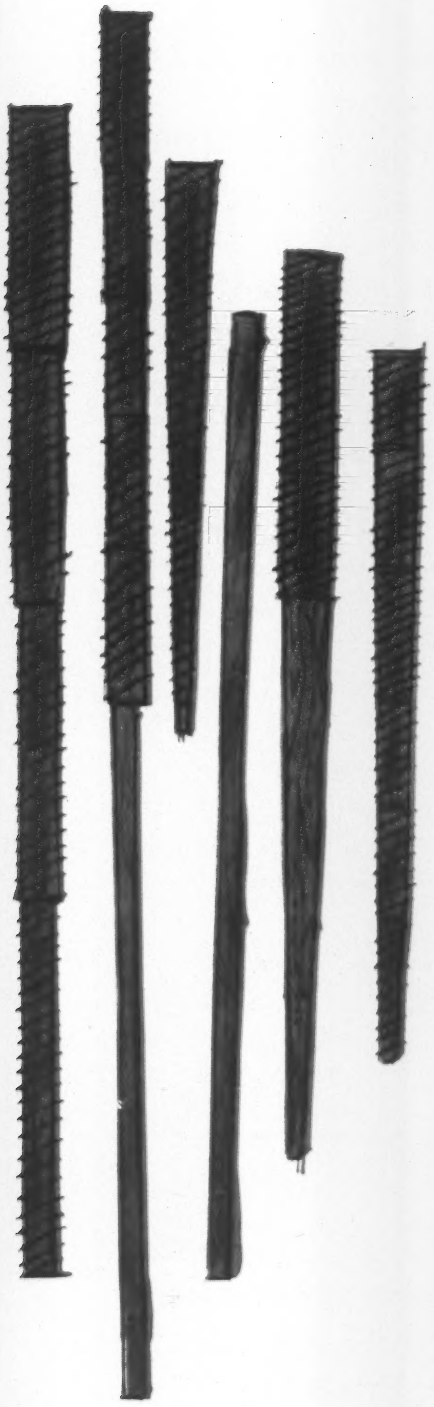

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Came as a bit of a surprise the other day, when somebody sat down and totted up the types of piles regularly driven by Raymond. It totaled 109, and of these 75 are of Raymond's own design and manufacture.

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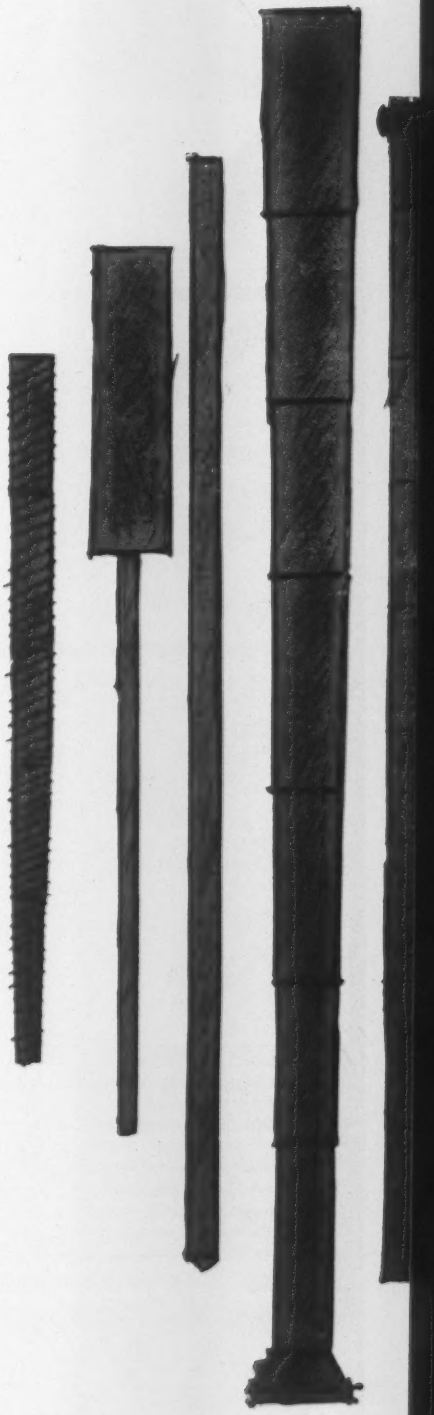

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. . . Reader Comment

(July, 1961) agrees with McLaughlin, and finds the cylinders far from handsome.

ISADORE ROSENFIELD
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Architects & Hospital Consultants
New York 36, *N. Y.*

Editor's Note—Experience with the clover-leaf design, up to the time the ENR article was published, does not bear out Mr. Rosenfield's criticisms. As the article pointed out, Ellerbe & Co. alone has 20 such designs on the drawing board or under construction.

Circles Around Before

SIR—I read with interest your article Hospitals Adopt Clover-Leaf Plan (ENR Nov. 2, p. 47). I am afraid, however, it had its origin, not five years ago in Rochester, but at least eight years ago here at Brookhaven National Laboratory. This particular approach was developed by the Architectural Planning Division in general and specifically by Donald A. MacCornack, Chief Architect. I am enclosing prints of the original planning sketches of his and a final contract drawing as done by Eggers and Higgins New York City architects.

JOHN M. RUDDY
Chief Engineer
Architectural Planning Division
Brookhaven National Laboratory
Upton, N. Y.

Squared Off

SIR—Your article Corrosion Wrecked Prestressed Tank (ENR Nov. 2, p. 23) surely should prove to be controversial, since it could also be aptly entitled "Mr. Feld vs The Prestressed Concrete Industry."

Mr. Feld claims that the failure occurred due to "internal disintegration of the wire fibers" while Schupack & Zollman claims that the failure was due to external corrosion.

Since the lower portion of the tank (which did not fail) was not subjected to external corrosion, it would seem that an examination of the wire in this area would prove conclusively who is right.

FRANCIS X. CROWLEY
Vice President
Natgun Corp.
Boston, Mass.

For Your Calendar . . .

National Association of Home Builders, annual convention-exposition, Chicago, Ill., Dec. 3-7. Write: NAHB, 1625 L St., NW, Washington, D. C.

National Society of Professional Engineers, annual winter meeting, King Edward Hotel, Jackson, Miss., Jan. 25-27. Write: NSPE, 2029 K St., NW, Washington 6, D. C.

Associated Equipment Distributors, annual meeting, Hilton Hotel, Chicago, Ill., Jan. 28-Feb. 1. Write: AED, 30 E. Cedar St., Chicago 11, Ill.

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...on the spot...speeds Minuteman ICBM base construction

How do you pour concrete for 150 missile silos and 15 launch control centers — when they're scattered over a 20,000 sq. mile area? Conventional methods are out. Central plant mixing would require grueling 50-mile truck hauls — with segregation and equipment wear and tear. Portable plants would require almost perpetual erection and knock-down operations. The answer then: *eliminate* the conventional batching/mixing plant!

That's exactly what T. L. Smith did.

Working with subcontractor and contractor, Smith engineers mounted a Turbine mixer, plus water tank and metering equipment, on a flatbed truck. Then compartmented semi-trailer trucks could dump premeasured dry batches onto a Smith-Gregco conveyor for charging the Turbine. Thoroughly mixed concrete comes out in *60 seconds* for immediate placement by crane bucket.

Operating on a one-minute cycle, these truck mounted plants represent a totally new concept in the mixing and delivery of concrete *at* the job site. They have the speed and mobility of a truck mixer, the production capacity of a conventional batching/mixing plant!

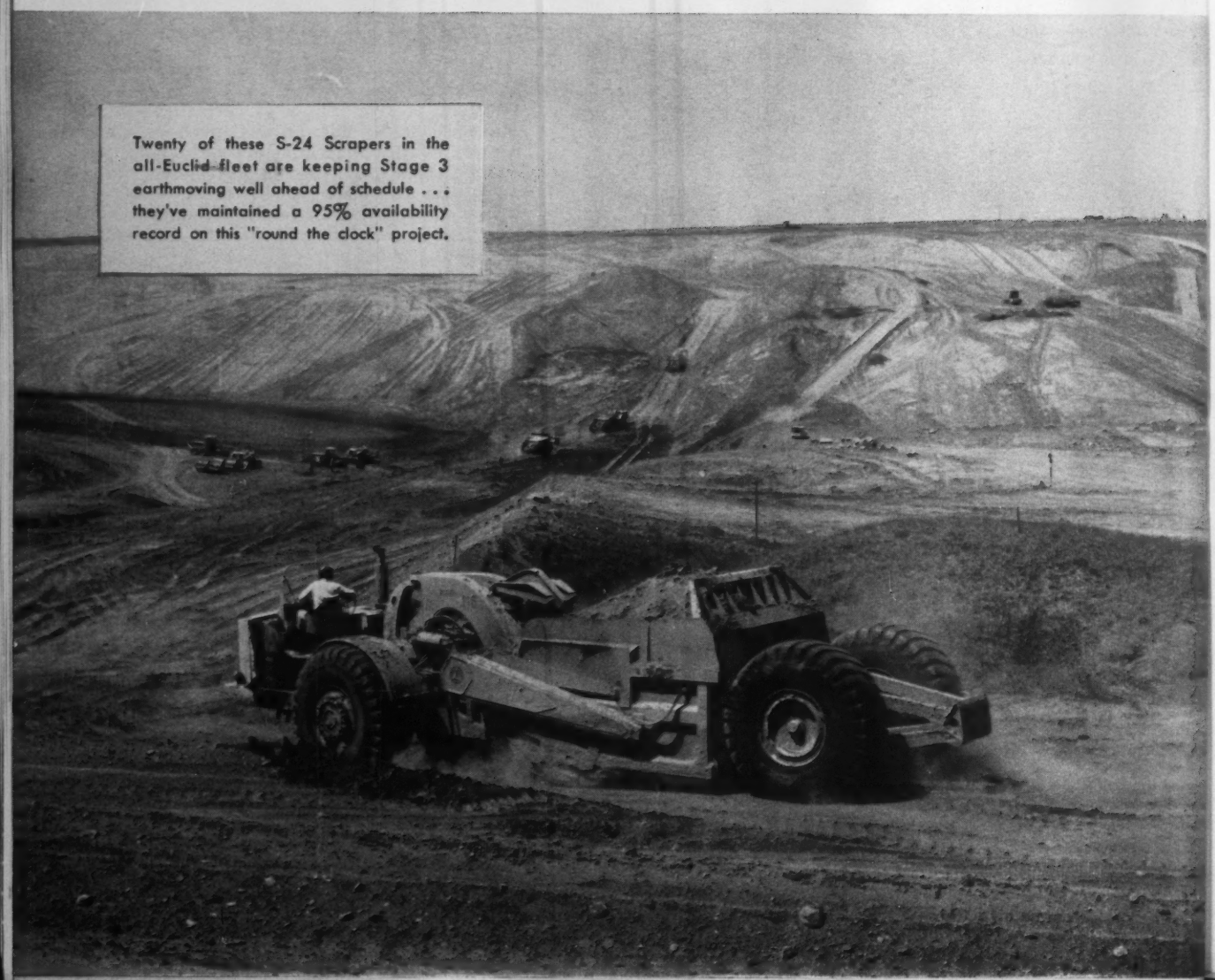
Result? Vital ICBM silos and support facilities are being completed on schedule — practically and economically.

This is the kind of creative engineering and wholehearted cooperation you get from Smith. It's the reason why so many contractors and concrete suppliers look to Smith for significant break-throughs in the science of mixing and transporting concrete!

SMITH **THE T. L. SMITH COMPANY**
Milwaukee, Wisconsin / Lufkin, Texas

Affiliated with Essick Manufacturing Company, Los Angeles, Calif.

All-Euclid Fleet moves 2 million yds. in one month



Twenty of these S-24 Scrapers in the all-Euclid fleet are keeping Stage 3 earthmoving well ahead of schedule . . . they've maintained a 95% availability record on this "round the clock" project.

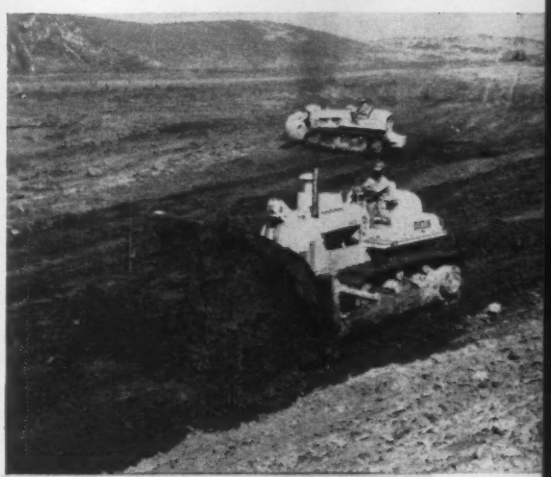
Bedford Const. Co. using 37 Eucs for Stage 3 of South Saskatchewan Dam

"Euc" TC-12 Crawlers and S-24 Scrapers make an ideal team for high production earthmoving on this 26 million yd. contract with a tight completion schedule. Heaped loads of 32 yds. are pushed out in 30 seconds or less . . . best record for a TC-12 to date is over 700 loads in a 10-hour shift.

Largest rolled earth-fill dam ever built in Canada, South Saskatchewan will be 210 ft. high with a main embankment 8,000 ft. long. It will require 52 million yards of excavation and is scheduled for completion late in 1965. Bedford Construction Co. of Toronto. Ont., has the contract for Stage 3 of this big project—26 million yds. to be moved by June, 1963.

On this well organized, high-speed, high production job the all-Euclid fleet works 20 hours a day, six days a week. Bedford Construction purchased 24 Euclid Scrapers of 32 yds. heaped capacity (20 Model S-24 and 4 Model TS-24 "Twins"), 7 Model C-6 and 6 Model TC-12 Crawlers after thorough study of the productive capacity and job availability of competitive equipment . . . on earlier construction at this project and on other jobs.

During a recent month these "Eucs" moved 2 million bank yards on hauls up to 9,000 feet one way . . . with production hitting 50,000 yds. a shift. The big TC-12 crawlers push heaped loads out of the borrow pit in less than 30 seconds. With this kind of production Bedford Construction expects to beat the tight schedule by six months . . . no wonder that Project Manager Vic Grant reports, ". . . we're confident our choice of equipment was the right one"!



Bedford Construction is using 7 C-6 "Euc" tractors for dozing and towing compaction equipment on the fill. All-wheel drive TS-24 Scrapers—four of them—clear out muck holes and maintain haul roads . . . after a near cloud-burst they cleaned up impassable haul roads so that the S-24 fleet was rolling again in only 7 hours.

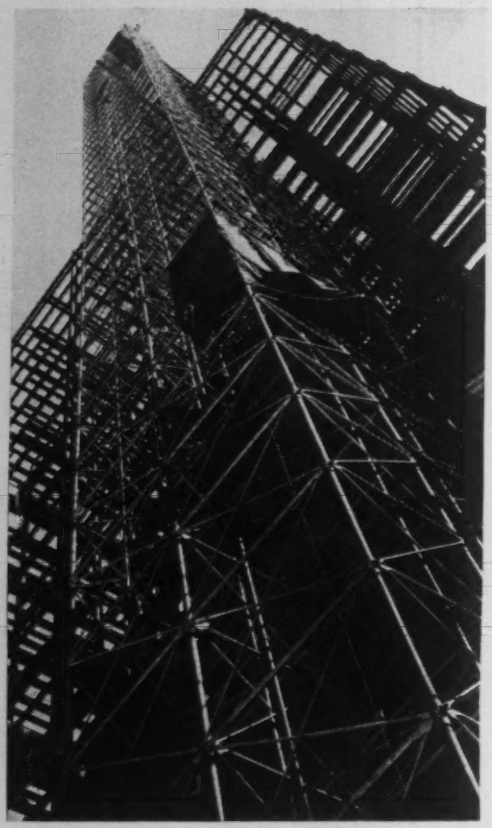
GM GENERAL MOTORS EUCLID

EUCLID

DIVISION OF GENERAL MOTORS, HUDSON, OHIO

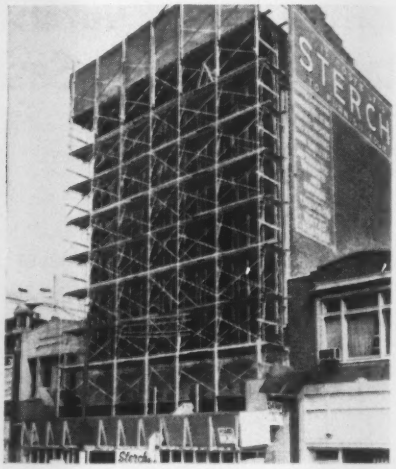
Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

Scaffolding and Shoring Methods . . . by PSCO



19-Story double hoist tower . . .

For fast lifting of materials during construction of Mercy Hospital, Baltimore, Consolidated Eng. Co., contractor, uses this 39-section, 253-ft. 6-in. high "Gold Medal"® Double Hoist Tower. "TubeLox" Scaffolding is used to make runways to each floor.

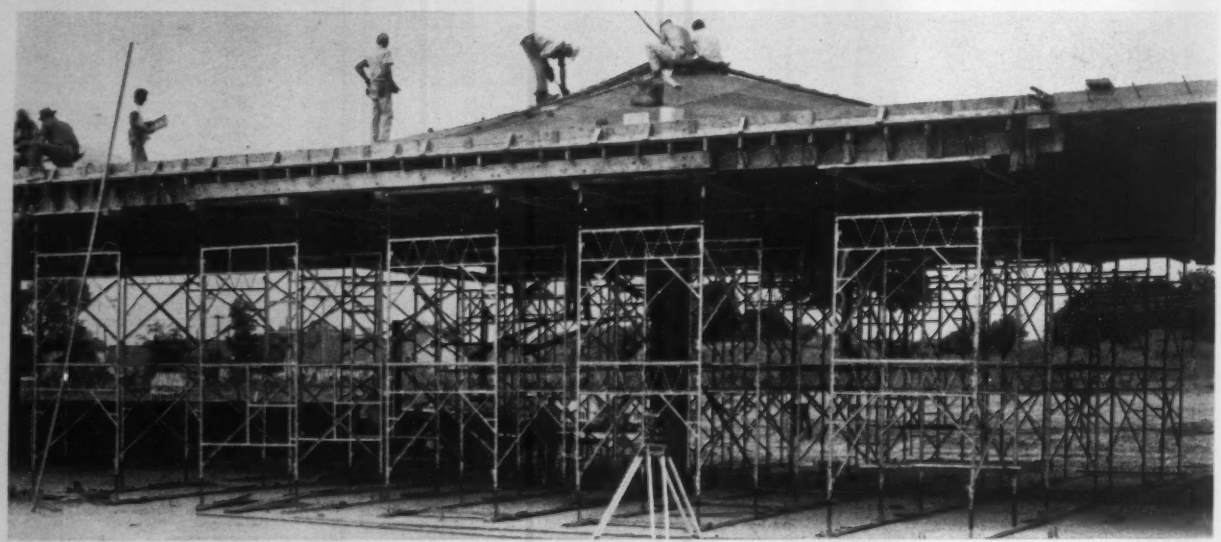


Refacing Scaffold . . .

To provide access to the entire front of Sterchi's Furniture Store, Charlotte, N. C., Foard Construction Co., contractor, uses 75 "Trouble Saver" Scaffolding frames. Planking erected on top of each row of frames provides working levels for refacing operations.

Hyperbolic paraboloid forming support . . .

This photo illustrates how easily "Trouble Saver" Shoring can be placed to support wood trusses which are used to form one of the many hyperbolic paraboloids on the new Government Employees Exchange building, Latham, N. Y. Two-frame high shoring towers, with sills attached, were slid from one paraboloid to the next.



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THE CONSTRUCTION WEEK

OLD NAME, NEW SETTING—Clancy O'Dell, who has earned a measure of renown in the past among hard-rock tunnelers as a project manager, started earning it as a company president last week. His new Clancy M. O'Dell Construction Co. bid low on its first try—$11.2 million for San Francisco's 10-mile Canyon power tunnel (see p. 24). The O'Dell company has a backstage affiliation, for this job at least, with C. J. Langenfelder & Son, Inc., of Baltimore.

WHY HIRE CONSULTANTS?—The Consulting Engineers Association of Colorado this month will submit to Gov. Steve McNichols, at his request, a specific report setting forth advantages to the state of using consulting engineering services. Consultants have been seeking a larger share of state work and a wider dispersion of state work now being done by them.

DUNN TO HEAD AGC STAFF—William E. Dunn, named to succeed the late James D. Marshall last week, will bring a legal and labor background to the job of Executive Director of the Associated General Contractors of America. Before joining AGC in 1947, 52-year-old Dunn practiced and taught law in Chicago. Before becoming assistant executive director in 1956, he managed AGC's labor department.

SEWER STUDY SPLIT NINE WAYS—The Metropolitan St. Louis Sewer District plans a $327,000 storm drainage study of the entire District, but it's splitting the engineering among nine separate firms—each to get a watershed. The long-range studies are partly financed by a $218,000 federal grant.

BOATING IN THE BASEMENT—A 600-ft-wide bridge over the Ohio River has been proposed as a site for a Cincinnati stadium, a hotel and supporting facilities. Chief argument for a $40-million bridge platform site: It would require neither land acquisition nor removal of land from tax rolls. The South Dakota State Highway Commission is trying to sell a 2,700-ft, 35-year-old, steel truss bridge over the Missouri River at Pierre and suggests it would be a great place to build a motel.

LESSONS FROM FIRE—Building code and zoning changes will result from the Los Angeles fire that destroyed 460 houses and caused $25-million damage. Since 50% of the houses destroyed or damaged lacked fire-resistant roofing, chances seem good that wood-shingle roofs will be prohibited in the future.

QUANDARY FOR SCHOOLS—The drive to build shelters at schools to protect students from nuclear fallout has most school districts over a barrel. They can hardly afford to build classrooms. One economical out, underground classrooms, isn't popular with parents.

78-inch Drain Line for East-West Taxiway, Hancock Field, Syracuse, New York

Contractor:
William E. Bouley Co., Inc., Auburn, N.Y.

Control Water–and Costs–with Moretrench

MORETRENCH WELLPOINTS, on one side of the trench only, absorbed 12 feet of water in sand, silt and clay. Contractor's progress ranged from 100 to 150 feet per day. Control of water meant control of costs.

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WASHINGTON OBSERVER

- **Truckers ask increased size, weight limits**
- **Financing sought for Inter-American Highway**
- **Peace Corps urgently needs construction men**

● **The trucking industry is pressuring for an increase in size and weight of trucks permitted on federal-aid highways.** Officials of the American Trucking Associations, in a series of bluntly worded speeches, complain that though truckers make a substantial financial contribution, they are not realizing full value from the roads. They also suggest a new road classification plan so that vehicle sizes and weight maximums are not subject to limitations required for older and poorer highways.

The Bureau of Public Roads will recommend a size-weight policy to Congress early next year. Its proposals will be based to a great extent on findings of the recent AASHO road test at Ottawa, Ill. The Bureau will recommend either continuation of existing federal limitations, a new set of federal standards, or repeal of federal limits with a return of size and weight controls to the states. AASHO favors the last, but is hardly likely to get its way.

—

● **The Administration is planning a major push next year to complete the long-delayed Inter-American Highway to Panama.** The feeling is that congressional sentiment now favors a sizable appropriation—the U. S. share is figured at about $55 million for completion—as part of the program to build Latin American economies.

Estimated cost of finishing the highway is $82.5 million. This estimate, subject of some controversy, will be used by the Bureau of Public Roads and the State Department in making their pitch to Congress early in 1962. Administration officials have made a survey of Congress and believe the climate is right for congressional approval.

—

● **The freeway-vs.-rapid transit battle in the nation's capital has ended with a victory for highway forces.** The National Capital Planning Commission has approved four controversial inner-loop freeway projects after a cliff-hanging hesitation in which rapid-transit advocates fought for elimination, or at least delay, of all or some of the projects.

The Commission added a major stipulation to its approval, however. Designs of two of the projects—a big downtown interchange and a north-south leg near the Capitol—must win the Commission's further approval before they are put out for bids. The group wants to make sure that the projects do not detract from the beauty or the livability of the areas they will serve.

—

● **The Peace Corps has plenty of applicants, but not enough specialists.** Most of the applicants, officials say, are liberal arts college students or graduates. Urgently needed are construction hands, heavy equipment operators, farm experts and medical technicians.

A GOOD GRATING INSTALLATION TAKES GOOD ENGINEERING

Borden quality standards of engineering and manufacturing are *apparent* in the final installation which is always properly fitted, symmetrical, and free from warps or camber.

Here's how it's done. A good grating installation starts with proper planning and checking. This free service by Borden insures correct dimensions, fit and placement. Where necessary, it begins with a shop plan of the grating area, continues with careful checking of each grating panel and layout of entire platform on our shop floor. It concludes with a complete erection diagram showing panel-mark numbers corresponding to those on each grating panel.

The Result: A trouble-free field installation.

But even more: Borden manufactures every type of floor grating and safety step—your assurance of the right grating for each job.

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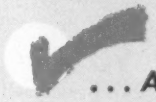
How the Bond Issues Fared . . .

Of more than $1-billion worth of construction proposals, voters . . .



. . . Approved
$410 million

. . . Rejected
$638 million

Bond Rejections Soar to 61%

Voters smashed the construction hopes and plans of many local and state government officials last week; they approved only 39.1%—$409.6 million—of the $1.05 billion worth of construction proposals.

This approval rate stands in sharp contrast to that of 1960's general election when voters said "yes" to 94% of a record $3.4 billion in construction-bond proposals. It also compares unfavorably with a 56% approval rate on $1.02 billion in proposals in 1959, then the lowest rate of approvals since 1956.

(ENR's totals and computations exclude non-construction proposals. In this category fall land-acquisition bond issues and transportation-equipment issues. Major proposals in these groupings include New Jersey's $60-million park-land acquisition proposal, and New York State's proposal that would guarantee $100 million worth of Port of New York Authority bonds for purchase of railroad passenger equipment.)

To a great extent, however, this year's result saw history repeated. In 1959, the proposal-total of $1.02 billion included a $500,000 school proposal in New York State. It went down to defeat.

This year, the $1.04-billion proposal-total included a $500-million bundle, again in New York State and again for educational purposes. Voters rejected the measure, which would have permitted the state to guarantee up to $500 million worth of bonds sold by any institution of higher learning, religious or nonsectarian. That did it. Groups inside and outside religious circles strongly opposed the measure. They argued that aid to sectarian schools would infringe on the separation of church and state.

So, excluding the New York State proposal would provide a different—but might-have-been—picture: proposals totaling $547.8 million for an approval rate of 75%.

It appears that the nuclear age has ushered in a new bond-proposal category, that of bomb-shelters. Only one such proposal appeared on this year's ballots, but they probably will be more numerous in years to come. Terrace Park, a Cincinnati suburb, probably qualifies as the nation's first community to propose—then pass—such as issue. It totaled $250,000.

In North Carolina, voters apparently expressed their resentment toward a new sales tax on food purchases. They resoundingly defeated $61.7 million worth of bond issues for institutions, ports, buildings, and state universities and colleges. Gov. Terry Sanford strongly backed the construction bundle, but his tax and spending policies helped spell defeat.

In other states, the approval rates showed a relatively high degree of voter-selectivity in certain areas of proposed activity.

Public buildings proposals took a beating. Out of proposals totaling $10.5 million, only $225,000 worth—2%—got the nod. In addition to rejection of state office buildings in North Carolina—part of the $61.7-million bundle—major projects defeated included a $2.7-million courthouse in Cleveland and a $3.3-million welfare commission building in San Francisco.

The voters also looked unkindly on projects under the general heading of recreation: swimming pools, golf courses, parks and auditoriums. They turned

Construction-Bond Scoreboard

Purpose of Bonds Proposed	*Passed*	*Defeated*
Waterworks	$ 189,571,000	$ 4,625,000
Schools	30,148,000	14,839,000
Highways, Roads, Streets	25,520,000	15,000,000
Sanitation (sewers, treatment, incinerator)	37,512,000	15,925,000
Fallout Shelter	250,000	0
Institutions	45,715,000	11,950,000
Ports, Docks	15,402,000	13,500,000
Public Buildings	225,000	10,260,000
Recreation (parks, pools, auditorium)	4,935,000	10,141,000
Colleges, Universities, Libraries	810,000	538,000,000
Utilities, (gas & electric)	2,200,000	0
Industrial Buildings	50,000,000	0
Airports	2,825,000	4,000,000
Urban Redevelopment	920,000	0
Rapid Transit (excludes rolling stock)	3,568,000	0
TOTAL	**$409,601,000**	**$638,240,000**

thumbs down on $10.1 million worth of such proposals out of a total of $15.1 million.

Airports ranked low, too, but the total volume proposed was relatively small. Proposals totaled $6.8 million accounted for by a $4-million proposal in Cleveland and a $2.8-million proposal in Philadelphia. Voters in Cleveland said "no," but Philadelphia's project went through as part of a bond package totaling more than $65 million.

Industrial building, water development, institutions, sanitation and sewerage, and schools did well. A $50-million New York State proposal that would place the state's credit behind industrial-building bonds met a favorable decision, giving this category a 100% score.

Waterworks proposals sailed through dramatically in light of the huge amount involved. This sector of activity contained $194.2 million worth of proposals of which $189.6 million obtained a green light.

San Francisco, however, heavily weighted the waterworks section with a $115-million request. In addition, two irrigation districts acted on two separate bond issues of $52.5 million as their share of one phase of the San Francisco project. The districts and San Francisco voted affirmatively on their respective proposals.

The funds will finance doubling of the Hetch-Hetchy water supply system. The program calls for construction of eight major projects including a new Don Pedro Dam on Tuolumne River, a $22-million San Antonio Dam, pipelines, pumping stations, and reservoirs.

Storage and distribution facilities, when completed, will guarantee delivery-capacity in the Bay Area of about 300 million gal per day up to 1985 and additional water storage in the Sierra Nevada Mountains of 400 million gal per day for at least 50 years. Consumption now runs at a rate of more than 167 million gal per day.

In the meantime, officials kept moving on other phases of the project using funds authorized at a 1955 referendum when voters cleared a $54-million proposal. Two days after this most recent election, the San Francisco Public Utilities Commission opened bids on the Canyon power tunnel, part of the Hetch-Hetchy water system.

The apparent low bidder, Clancy M. O'Dell of Baltimore, Md., pleasantly surprised—perhaps jolted—the commissioners with a bid 27% under the $15.2-million estimate.

The 14½-ft-dia tunnel, will carry water 10 miles from the Hetch-Hetchy Reservoir to an early-intake diversion dam of O'Shaughnessy Dam on the Tuolumne River.

Local Spending Up; Bonds Help Pay Bills

State and local government is big business. It employs over 5 million persons, more than any U. S. industry except agriculture and retail trade. It buys more than 20% of the nation's new construction. And over-all, it purchases nearly seven times more nondefense goods and services than the federal government.

This year, for the sixteenth consecutive year, state and local spending will establish a new high—$51.3 billion. This compares with outlays of only $8.1 billion in 1945, according to the U. S. Department of Commerce.

But referring to state and local government in the singular obscures the number of governments that buy goods —more than 90,000 individual units. Almost every one qualifies as a potential buyer of construction services. Last year these units accounted for $12.6 billion worth of construction. States spent $5.9 billion of the total, local governments the remaining $6.7 billion.

By the latest count there are 50 states, 3,047 counties, 34,381 cities and 54,459 special districts. The latter include school districts, road districts, sewer districts, water districts, fire-fighting districts, even mosquito abatement districts.

The total roughly equals one government for every 2,000 persons and every 40 sq mi. The total is also too much of a good thing, according to some economists and students of government.

A special Presidential Commission on Intergovernmental Relations concluded some years ago that the U. S. has "too many local governments, not enough local government."

Recently, Harvard University's Robert C. Wood, in a study of the New York Metropolitan Region (1,400 governments) found that development of hundreds of separate policies established by hundreds of jurisdictions leads to poor regional planning and a shortage of services needed by the area as a whole.

Among the several reasons for problems created by this oversupply of political subdivisions, three stand out:

- Small size—Many local governments are too small. For example, public health authorities say that few communities with less than 50,000 people can support a good health program. On this basis, most of the nation's towns and counties are undersized.
- Poverty and plenty—Some units find it difficult to make ends meet, while others, sometimes next door, roll in affluence.
- Sense of proportion—Overlapping governments, particularly overlapping special districts, make intelligent budgeting almost impossible. Responsibility is fragmented, each small service exaggerated and those in charge denied the most important job—weighing the respective merits of competing programs.

Although many of the criticisms may be justified, state and local governments manage to get along. In the process, they touch the individual more frequently and at more points than the federal government. They educate children, build and repair roads, provide water supply and sanitation, put out fires, protect property from thieves and decide what building can go up in which area.

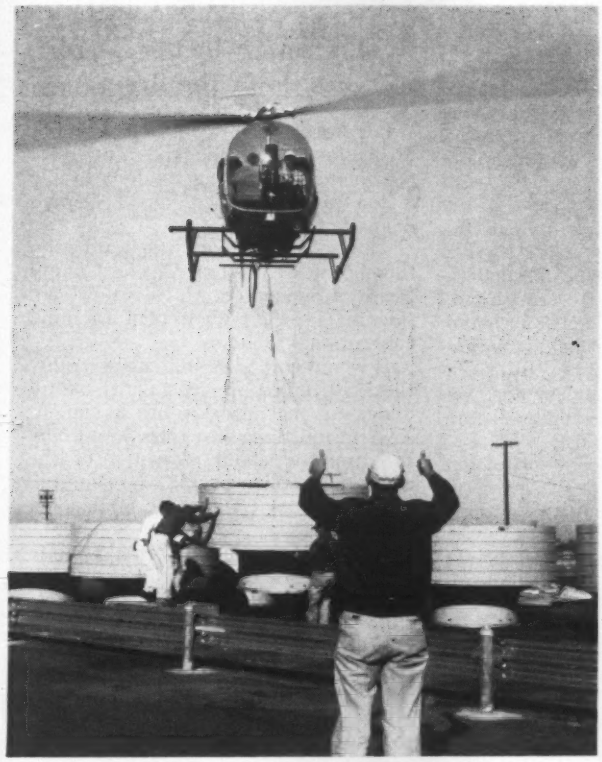
A close look at the expenditures of these governments shows just how close statehouses, courthouses and city halls are to everyday life.

State governments currently devote some 33% of their direct spending (total outlays minus grants to other governments) to building and repairing highways. They spend 16% on education, primarily at college level, 13% for welfare, 11% for public health. The rest pays for general housekeeping functions and such diverse activities as placing historical markers along Ohio's Anthony Wayne Parkway, fighting Bang's disease in Oregon and maintaining Padre Island State Park in Texas.

Local governments spend the bulk of their money (almost 45%) on elementary and secondary education, 10% on public health, 9% on roads, 8% on police and fire protection and less than 10% on public utilities and assistance.

But whatever the purpose, the governments must search arduously for more revenue. State after state has imposed a sales tax, a personal income tax, corporation tax, perhaps all three. Despite these levies, tax receipts continue to fall behind outlays. Increased borrowing through sale of bonds and a sharp rise in federal grants help take up the slack.

State and local spending will steadily advance through the present decade, rising to $78 billion a year by 1970, or about 10% of projected Gross National Product.



Helicopter picks up fan unit from storage area (left), positions it on factory roof (right).

Helicopter Hustles Ventilator Installation

What is the quickest and cheapest way to put 49 exhaust fans on a 10-acre factory roof? A California mechanical subcontractor's answer to this question is a helicopter.

The helicopter placed slightly more than half the units in less than half a shift. Average time the helicopter took to pick up a roof ventilator (or part of one for bigger units), set it in final position and return for another pick was three minutes.

The ventilators were installed on a one-story glass factory being built for Libby-Owens-Ford at Lathrop, Calif. Hansens, Inc., mechanical subcontractors, Modesto, Calif., developed the erection method working with Calicopters, of Stockton, Calif.

Based on estimated helicopter charges of $200 an hour, (the Calicopter price turned out to be somewhat less than this) and an average time of about five minutes, the contractor figured that helicopter installation costs would be cheaper than any alternative method.

Because of the great expanse of the roof, a crane could not set the units in place. The subcontractor would have had to roll them to final position and then lift them into place.

Calicopters used a supercharged Bell helicopter. At sea level, loaded with a pilot and 10 gal of gas, the machine can lift a net weight of 870 lb. Since some of the powered roof exhaust fan units weighed more than this, these were assembled in two sections for the airlift operation. No one piece weighed more than 750 lb. Thus, a total of 79 lifts were required to place the 49 roof units.

The contractor scheduled the operation for two separate days. A little more than half of the units were placed on the first day. As it turned out, the helicopter could have placed all of the units in a single day's operation. But only part of the roof was completed and the contractor wanted to get the roof ventilators on that part before winter rains set in. Early enclosure permitted installation of machinery inside the factory to be started.

Calicopters furnished the helicopter with pilot and mechanic and stationed ground crewmen to signal the pilot both at the parking lot where the lifts originated and on the roof. Hansens needed two men at those places, to hook and unhook the slings and to guide the air vent units. Actually, both groups had additional men available because of the newness of the operation. But the entire job could have been accomplished by eight men—four provided by the helicopter company and four provided by Hansens.

Calicopters made and provided four lifting slings. The helicopter returned them to ground level every second or third trip.

A sling, made of ¼-in. aircraft cable with 2,800-lb. ultimate strength, provided four-point pickup. Workmen attached it to a quick-release device hung on the helicopter. When the exhaust fan units were in final position, the pilot released the sling on a signal from his ground crewman. Maneuvering of the exhaust fan units was accomplished by movement of the helicopter; only minor shoving by workmen on the ground or roof was necessary.

The pilot was able to hover within a fraction of an inch of desired elevation. And lateral positioning of the machine was precise, too.

During the operation, the aircraft made complete round trips in as little as 1 min. 27 sec. Every third or fourth trip took a few seconds longer, to pick up and drop off the slings. The rig was refueled fast, too, it took 2¼ min to fill the tank. And the pilot took a 10-min break about once an hour. The result was a 3-min average per piece placed.

Swinerton & Walberg, Inc., of San Francisco, is the general contractor.

FAA Demands Modern Airports

The federal government is stepping up pressure on local communities to improve their airports to help make the nation's air transportation system safer and more efficient.

The Federal Aviation Agency, acting on orders from President Kennedy, is drawing up a set of standards and will rate airports on how well or badly they meet its criteria. FAA will follow this up with a campaign to see that airports that are deficient undertake improvement programs.

The standards will cover every element having an important bearing on the safety and efficient flow of aircraft into and out of airports. They will, for example, measure the adequacy of runways and taxiways, navigational aids, traffic control, fire and rescue protection, medical facilities and regulations against obstructions around airports.

FAA will consult with airport managers, pilots and the airlines before settling on a final set of standards. It will then use three weapons to try to obtain compliance:

- Moral suasion—It is presumed that no airport will want to carry a poor government rating. This would tend to discourage use of the airport by the public and the air carriers.
- Allocation of federal-aid airport construction funds—FAA will encourage needed improvements in allocating this money.
- Power to restrict operations—FAA, in extreme cases, can order airlines not to use airfields considered inadequate and unsafe.

New support for the FAA's drive came this week from a Presidential task force that reviewed the adequacy of the air traffic control system operated by the federal government. The task force laid out a broad program for improvements in routing and ground-to-air policing.

The task force, known as Project Beacon, also raised the point that improved traffic conditions in the sky are undermined if the traffic bottleneck on the ground at airports is not eased.

The task force reported that 14 major airports are now overloaded or within 10% of maximum capacity. By 1970, 48 will be overloaded unless new airports are provided or additional runways at existing fields added.

The task force outlined steps for improving plane-handling capacities of already-constructed airports. Among other things, it urged:

- Construction of parallel runways where feasible to permit simultaneous all-weather takeoffs and landings.
- More high-speed turnoffs to clear runways quickly of landing planes with varying ground maneuverability characteristics.
- Passing provisions on taxi strips to provide access to runway takeoff positions for cleared planes ready to depart. This might be accomplished with more taxi strips, wider strips, bypass areas or "runup pads" off taxi strips.
- Development of ground decelerating devices to halt planes that overshoot runways.
- Expedited programs to provide standardized lighting and take off, landing and ground control aids.
- Improved methods of clearing runways of snow and slush in winter.

Filter Foils Fallout, Germs, Gas

The American Chemical Society's answer to atomic-age warfare is a subbasement parking garage adapted to give protection against fallout, germs and nerve gases.

The shelter, being constructed under the Society's Washington headquarters, will accommodate 700 persons for two weeks.

The $44,000 shelter may not be blastproof, but the nine-story concrete building above it is expected to give some protection.

Sealing and air-filtering arrangements in the new shelter will follow the recommendations of the American Chemical Society Committee on Civil Defense.

The American Chemical Society's filter system will include the 0.3-micron "absolute" filter specified by the Atomic Energy Commission. Air will enter the system through a rough prefilter, pass through a right-angle bend into a blast-baffle chamber and through another right-angle bend. It then passes through two more prefilters connected with a 90-deg bend before going through the absolute filter and a charcoal filter.

The absolute filter is designed to screen out smoke and radiological and biological particles. The charcoal filter removes gaseous agents.

Air at 4 cfm per person will be drawn through the system. This is 30% more than the minimum specified by the government. Positive internal air pressure will be maintained to prevent contaminated air from leaking into the shelter. Water tanks connected to the regular system can be sealed off.

Wilberding Co., Inc., consulting engineers, and Faulkner, Kingsbury and Stenhouse, architects, designed the shelter. Both firms are located in Washington.

Sewer Shelters? No

LA sewer shelter plan goes down the drain

Los Angeles can't count on its storm drains for fallout shelters. The price tag for making the big conduits livable is too high and there aren't enough drains to go around.

This sobering report was heard early this month by the Los Angeles County Board of Supervisors which is now considering a $400-million plan to build conventional shelters.

It would cost $169 million to modify the 450 miles of rectangular storm drains in the area for use as fallout shelters and these structures could only accommodate about a quarter of the county's 6 million people who comprise nearly 40% of California's total population.

The chief engineer of the County Flood Control District told the Board that a survey of the district's labyrinthine storm drainage system shows that a typical mile of 8 x 7½-ft box drain, modified at a cost of $375,000, would accommodate 3,250 persons.

But drains must be ready at all times to carry storm water. Hence, "extra facilities" would have to be built adjacent to the drains, according to the engineers' report.

Board Chairman Ernest E. Debs also pointed out that because the drains are built in areas of greatest flood-control needs, regardless of population concentration, many people would not be able to reach the shelters. This being the case the county presently is considering putting a $400-million bond issue on the ballot next June to finance construction of shelters on public school grounds or adjacent parks. These would be used not only by school children, but also by residents of surrounding communities.

Fallout Shelter Bill Passes in New York

New York State's legislature approved a $100-million fallout shelter program in a special session last week. The funds will aid fallout-shelter construction for schools, colleges and state institutions.

The state will contribute up to half the cost of fallout shelters constructed voluntarily by public and private schools and colleges. An estimated $85 million will be available for this kind of aid. The remaining $15 million will finance shelter construction for units of the State University.

To finance the shelter program, the state legislature is expected to "unfreeze" $100 million previously set aside to match federal funds for highway construction. These funds will not be available this year.

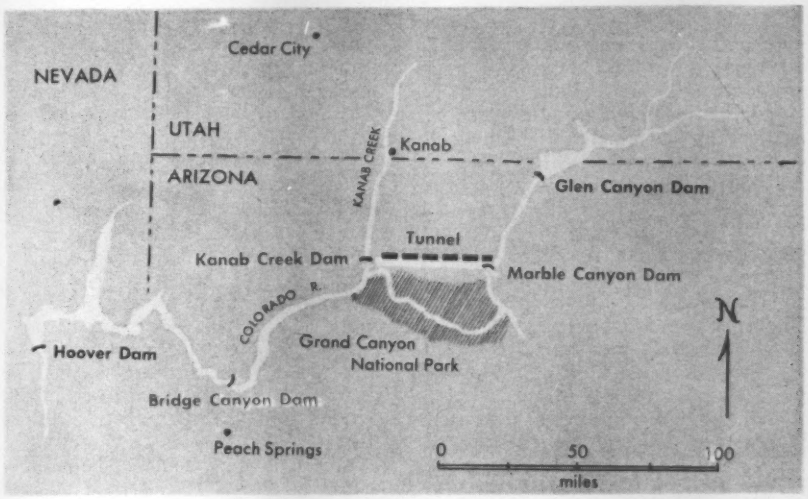
Competition Sharpens on Lower Colorado

Everybody wants in on Colorado River water and power between Glen Canyon and Hoover Dam.

The Interior Department backed onto the bandwagon last week to join the Arizona Power Authority, Los Angeles Water & Power Department and the Metropolitan Water District of Southern California.

Assistant Interior Secretary Kenneth Holum revealed Interior's interest by asking Federal Power Commission Chairman Joseph Swidler to delay hearings on the Arizona Power Authority's Marble Canyon Dam license application. The Bureau of Reclamation might want to build it as part of the Central Arizona Project, Mr. Holum said.

The Central Arizona Project is a billion-dollar-plus scheme to divert water from Bridge Canyon or Lake Havasu (Parker Dam, on the Colorado below Hoover) to the Phoenix area.



Three dams and long tunnel figure in power race on the Colorado.

The federal government shelved the plan in the late 1940s. Arizona officials dusted it off last year when a U. S. Supreme Court special master recommended a reshuffle of lower Colorado water allocations that would give Arizona another million acre-ft a year (ENR May 19, 1960, p. 25).

The power authority's application to FPC includes dams at both Marble and Bridge canyons (ENR Jan. 7, 1960, p. 24). But the FPC decided to hold hearings only on the Marble Canyon part at present. No one else has formally applied for permission to build there. However, the Los Angeles Water & Power Department has applied for a Bridge Canyon licence. And both Los Angeles and the Metropolitan Water District of Southern California (water wholesaler to Los Angeles and several southern California counties) have requested as intervenors that the FPC broaden the Marble Canyon project to incorporate also a dam and powerhouse at Kanab Creek and a 44-mile power tunnel from Marble Canyon to Kanab Creek powerhouse.

Mr. Holum wants FPC to delay hearings until Congress has time to consider federal resource development in light of the Supreme Court's final decision in the Colorado water-allocations case. The court is expected to rule next year.

The litigation has prevented the Bureau of Reclamation from completing its studies between Glen Canyon and Hoover Dam, Mr. Holum says. Until the Bureau does finish, Interior won't release federal lands along the river that would be required for an FPC hydro license, he says.

Pumped Storage Begins at Niagara

The first pump-generator unit at the New York State Power Authority's Niagara Power Project is under test this week. Operating as a 37,500-hp pump, the single unit filled the 60,000-acre-ft reservoir (eight-sided shape in picture) to minimum pool in just under 20 hours.

When flow is reversed, the 206-in.-dia turbine turns the motor-generator producing 20,000 kw of power. Roughly two-thirds of a kilowatt-hour is returned for every kwh used in pumping.

Because the U. S.-Canadian treaty limits use of Niagara River water in deference to the scenic value of the Falls, pumped storage is required for maximum use of river flow at night and during the off-season for tourists.

Each of the 12 pump-turbines will pump 3,400 cfs at a net head of 85 ft. Water enters the 500-ft-wide power canal, which serves as both forebay and afterbay, from two huge conduits (two-pronged branch at upper end of canal).

When demand for power is high, water released from storage will generate power twice; first at the pump-turbine plant and then at the 1.95-million-kw main plant at the river's edge.

The first pump-turbine will go on the line as soon as tests are complete. Eight of the main plant's 150,000-kw units are on the line so far.

Coal-Water Slurry Successfully Burned

Coal mixed with water may turn out to be the most unmixed blessing the fuel-hungry power generating industry has had in many an age.

Like its competing fuels, coal mixed with water can now be piped long distances and burned just as it comes out of the pipelines. Jersey Central Power & Light Co.'s E. H. Werner generating station has a furnace now burning a test run of coal slurry—70% coal, 30% water.

The test is a joint undertaking by four companies that have a big stake in future coal pipelining: Babcock & Wilcox Co., New York City, maker of the slurry-burning furnace; Consolidated Coal Co., Pittsburgh; Jersey Central Power & Light Co., Morristown, N. J.; and Texas Eastern Transmission Corp., Houston.

Texas Eastern and Consolidated plan to build a coal pipeline from West Virginia to the New York-Philadelphia area and have it in operation "not later than 1964." The line will be between 20 and 30 inches in diameter and transport between 5 million and 10 million tons of coal a year.

The two companies will split the estimated $100-million cost of the line. It would be around 350 miles long with pumping stations about every 30 miles. They hope it will begin by serving six to nine electric utilities in the New York-Philadelphia area.

Until now, coal slurry had to be dried out before it could be burned. Babcock & Wilcox's cyclone furnace has made direct burning possible. The mixture, about the consistency of fuel oil, is sprayed into the first of the furnace's two chambers, there to be dried out and ignited by a cyclone of hot (700 F) primary air.

While burning at 3,000 F, the coal dust is carried to the furnace's second, larger chamber. Still more hot air is added to the cyclone and normally solid fly ash is spun out as a molten liquid. Water from the original slurry goes up the stack as vapor.

Moving coal by pipeline is not new. Consolidated has been doing it successfully for four years through a 105-mile pipeline from Cadiz, Ohio, to Cleveland. It was slurry from this pipeline that eventually wound up in South Amboy, N. J., for the test at Werner station.

Three million gallons of slurry were barged from Cleveland to conventional oil storage tanks in Newark, N.J. From the Newark terminal, it was barged to South Amboy and piped to the generating station.

As it came from the pipeline in Cleveland, the slurry was a 60:40 mixture. Before barge shipment, enough water was decanted to increase the coal concentration to 70:30. Decanting is simply allowing the slurry to settle in a tank and drawing clear water off the top.

Successful burning of the slurry is considered a breakthrough of the last scientific barrier to a large network of coal pipelines. Gallon for gallon, a 70:30 slurry produces only 45% as much heat as oil and will cost more to pipe. Also it burns cooler than dry powdered coal. But since coal handling equipment costs about $3.5 million in an average 500,000-kw generating plant, and since coal shipping charges may be reduced as much as $1 a ton, it is thought that a coal pipeline network may pay off handsomely.

Dambuilder Harvey Slocum Dies

M. Harvey Slocum, who never looked or acted his age, died at 74 last week in a hospital in India, near Bhakra Dam, the job he had been directing for the past 10 years.

America's most famous dambuilder, whose talents as construction superintendent and cost estimator had been utilized by nations on every continent, suffered a heart attack late in October. His death brought to an end one of the most colorful and productive careers in construction history.

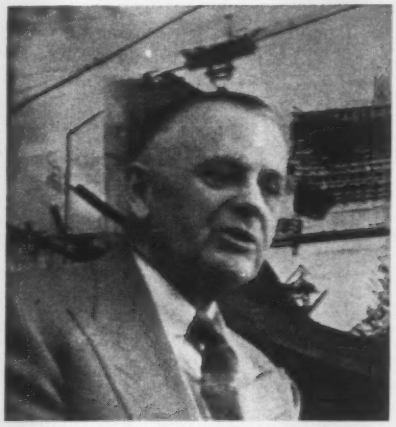
Harvey Slocum was a self-made construction man in the absolute sense of the term. Born in National City, Calif., he quit school after the eighth grade, and became successively an apprentice and journeyman carpenter, an ironworker, squad boss on concrete work and foreman by the time he was 25 years old. Five years later he was construction superintendent on Lake Hodges Dam, a multiple arch, being built for the city of San Diego.

From that time on he was always a construction superintendent in his own self appraisal, despite the titles (he called them "just fancy monickers") that many of his positions carried. Outspoken to the point of rudeness, he never left any doubt on his jobs that he was the boss, which earned him the affection of his workmen, the fear of his foremen and the respect of his employers, who numbered many of the great names in the construction business.

On his Bhakra Dam job in order to expedite the work he insisted on and got direct continuous access to Prime Minister Nehru.

Just prior to his engagement as "director of construction and plant design" on Bhakra in 1952, Harvey Slocum had been superintendent on Bull Shoals Dam in Arkansas, last of a long list of U. S. dams with which he had been connected. Among them were Grand Coulee, Shasta, Friant, Pine Flat, Hetch Hetchy, Sierra Madre, Gibraltar, Henshaw, Bullards Bar, Exchequer and San Gabriel, all in California.

During the rare periods when he was not busy on dam construction, he was engaged in such work as the Alcan Highway, the Apra breakwater in Guam, and coal stripping and mining. In recent years, even though his main attention was focused on Bhakra Dam, he accepted trouble-shooting and cost estimating assignments on dams in Brazil, Rhodesia, Australia and other countries. He could do this because of the unusual contract he had with the Indian government, which reveals both how much his services were sought after and in what a dedicated way he provided them.



M. Harvey Slocum

On its part the government of India agreed to keep a $100,000 deposit (equal to three years salary after taxes) in Mr. Slocum's name in a U. S. bank. Anytime Mr. Slocum decided to quit he could take it all, and in the meantime he could draw on it for any expenses he desired. Such withdrawals were to be immediately replaced by the government.

Most of Harvey Slocum's honors in the form of medals and scrolls came from foreign governments, except the two most significant ones. He was selected by both the Moles, the East Coast construction organization, and the Beavers, its complement on the West Coast, as the nation's outstanding concrete dambuilder.

Plaster Ceiling Survey Finds Few Failures

On the heels of a Corps of Engineers report of failures in metal-lath and plaster ceilings comes a report from the Metal Lath Association that says in the last 10 years failures of such ceilings have been rare.

The Corps of Engineers found ceiling failures in Army hospitals and classrooms. Chief trouble spot occurs where galvanized tie wires are embedded in gypsum plaster. The Corps now specifies stainless steel, nonmagnetic ties (ENR Nov. 9, p. 26).

The Metal Lath Association reports that the few ceiling failures that occur are invariably due to faulty construction. The report recommends five steps to good construction:

- Keep ceiling system free of work platforms and walkways.
- Attach mechanical equipment to structural members and not to suspended ceiling framing.
- Insure adequate ventilation above ceilings and below roofs.
- Check that roof and flashing are watertight.
- Use 1½-in. No. 11 barbed roofing nails with ⅞-in.-dia heads to attach metal lath to wood joists.

Construction Under Way On MIT Research Center

Construction has just begun on the first of five buildings planned for Technology Square, a $15-million research center near the Massachusetts Institute of Technology campus in Cambridge.

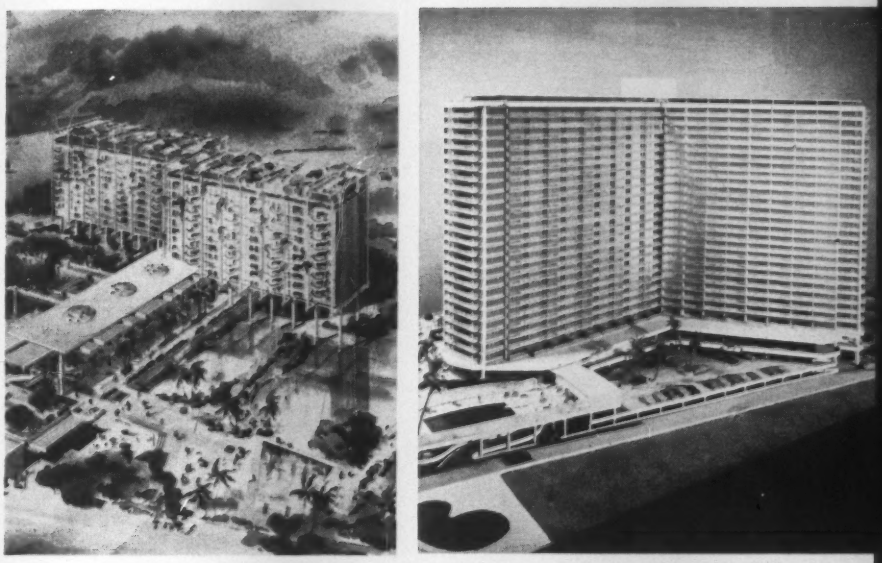
The first building will contain 135,000 sq ft of floor space in a reinforced concrete frame rising nine stories. Tapered columns will frame gray glass walls at ground floor level. Above, the walls will be precast concrete.

C-E-I-R, Inc., will install nearly $16 million worth of data-processing equipment in the top two floors. It will comprise the world's largest commercial electronic computing center, according to C-E-I-R (counsel for economic and industrial research).

A corporation formed by MIT and Cabot, Cabot & Forbes Co. of Boston will own and operate the center (ENR Feb. 4, 1960, p. 32).

The five high-rise buildings and some multi-story parking garages will surround a central plaza with courtyards, reflecting pools and planting areas. Ultimately the center will have 800,000 sq ft of laboratory and office area for lease to industry.

Cabot, Cabot & Forbes will design and build the center through its operating divisions: Cabot, Cabot & Forbes Associates, Inc., architects-engineers; and Aberthaw Construction Co., general contractor.



Hilton hotel (left), and Y-shaped building will rise in Honolulu.

Buildings Will Be Prestressed

Precast, prestressed concrete members will frame two buildings scheduled for construction on the Honolulu shore. One is a 27-story apartment house, the other a 10-story hotel.

The $23-million apartment house, overlooking Ala Moana Harbor, will be Y-shaped in plan. It will contain 1,056 units. The prestressed framing will be supported on 119,000 lin ft of piles, each pile carrying a maximum load of 100 tons. Construction will take 18 months.

John Graham & Co. of Seattle is the architect. Hawaiian Dredging & Construction Co., Ltd., is the general contractor.

Kahala Hilton Hotel Corp. will own and build the $7-million hotel. It will have 300 guest rooms. The structure will rise on stilts around and over a large salt water lagoon, in the Kahala residential district near Waikiki. It will have a private beach.

Killingsworth, Brady, Smith & Associates of Long Beach, Calif., are the architects, with Alfred Yee Associates of Honolulu as structural engineers.

Around the World . . .

- **Non-skid bridge**—An experimental paving material will cover a bridge on the Adirondack Northway, crossing the Albany-Schenectady Road in upstate New York. It will increase skid resistance, and protect the pavement from water infiltration and the effects of de-icing chemicals. The material, consisting of resin and glass fiber, and resin and crystallized silica, will go on the existing pavement.

- **The rain from planes**—Continuation of cloud-seeding experiments by the University of Arizona's Institute of Atmospheric Physics has been guaranteed by a two-year, $92,500 grant from the National Science Foundation. The Institute has been experimenting since 1957 on ways to increase natural rainfall by seeding clouds with silver iodide.

- **Iranian "TVA"**—All within one week the Shah of Iran inaugurated the just-completed $55-million Karadj Dam near Teheran and started concreting at $100-million Dez Dam in the country's Khuzistan region.

- **Israeli road plan**—The government of Israel plans a five-year road improvement program, at an estimated cost of $59.4 million. It will include widening the Tel Aviv-Haifa road to four lanes, and widening the Tel Aviv-Jerusalem road.

- **California airport**—The Board of Supervisors of Sacramento County has authorized the purchase of 2,200 acres for construction of a jet airport. The county will screen proposals from various engineering firms to design the new facility.

1950: Dilapidated docks crowded Jacksonville's downtown shore and an undeveloped wasteland marked the south shore.

Fitting Cities to the Future

Jacksonville Helps Itself

Jacksonville, Fla., has put up three bridges and more than 10 multimillion-dollar building projects since 1953. A spanking new sports coliseum now shares the limelight with the famed Gator Bowl. A $100-million expressway reaches out from the Gateway City and interlaces with the industrial arteries of the interstate highway system. And $21 million is going into the improvement of streets, sewers and sewage treatment plants.

A city of only 200,000 population, Jacksonville is growing rapidly:

Building permits jumped from $22 million in 1950 to $36 million in 1960. Bank clearings (now above $14 billion) trebled in the ten years following 1950 to give Jacksonville's banks a dollar flow about equal to that of New Orleans and Cincinnati, which have twice the population.

The recent renewal in Jacksonville, however, is not remarkable because of its size, but because it was started and sustained by a combination of private and public incentive. Within the past several years more than $200 million in public and private funds have gone into this work. But, except for Interstate Highway System sections of the Jacksonville Expressway, not one cent of federal money was used.

New industries, investment builders and a cooperative Chamber of Commerce have carried the private-work load. Most of the municipal improvements are paid for by profits from publicly owned utilities and bond issues floated to create improvement funds.

Three events sparked Jacksonville's redevelopment in the early Fifties:

- A $28-million revenue bond issue was floated, on October 1, 1950, for the Jacksonville Expressway. The expressway had been in planning for five years.
- The Prudential Insurance Co. of America decided early in 1953 to build its South-Central Home Office in Jacksonville. The State legislature had just granted a tax dispensation to out-of-state insurance companies that set up home or regional offices in Florida.
- In mid-1954, the city sold a $4-million revenue bond issue for the construction of a municipal parking lot on the downtown waterfront.

• **Waterfront boom**—The municipal lot on the waterfront provided parking for 1,844 cars and reduced traffic congestion. It also wiped out four blocks of dilapidated docks and encouraged construction on adjacent properties.

The completed parking lot was soon flanked by a $10-million office building of the Atlantic Coast Line Railroad and a $3-million Sears, Roebuck & Co. retail store on the west side. East of the municipal lot the county built an $8-million court house and the city put up a $5-million city hall.

But even before the municipal lot was completed, Prudential had decided on its building site. Encouraged by the plans for waterfront development on the north shore, Prudential built a 22-story office building on the south shore. From across the river in downtown Jacksonville, the $12-million tower serves as a symbol of rejuvenation.

• **Downtown reaction**—Hot on the heels of Prudential, a local insurance firm, the Independent Life and Accident Insurance Co. of Jacksonville, got a 19-story office building under way before Prudential's opening. Then followed the Insurance Co. of the South. So many other out-of-state companies moved in subsequently that Jacksonville became known as little Hartford. The city now houses over 6,000 home-office insurance employees.

Many people, including Jacksonville's Mayor-Commissioner Hayden Burns, believe the Prudential building supplied the primary incentive that united private and public interests in an all-out rehabilitation effort downtown.

A sure sign of downtown renewal

1960: Redeveloped shore lines and new high-rise buildings bring prosperity to the Gateway to the St. Johns River.

to Growth

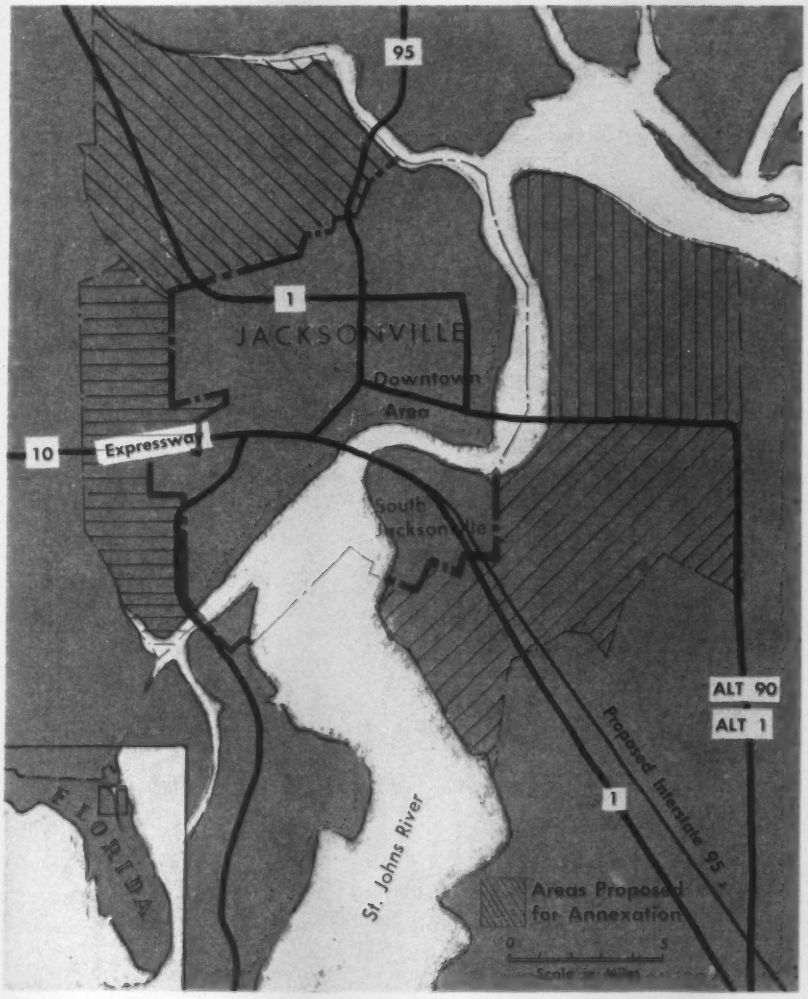
came with completion of the first new hotel in 30 years, the $6-million, 20-story Robert Meyer Hotel. Stimulated by this, other hotels undertook extensive renovation.

And as Jacksonville's newest bank building, the 11-story Florida National, nears completion, banks also are upgrading their buildings. The Barnett National and the Atlantic National have definite plans for additions. Barnett will build a 10-story building next to its present one; and Atlantic will erect a multistory garage across the street.

The renovation fever hit a peak when the May Co. bought Jacksonville's largest department store and remodeled it at a cost of $2 million.

At present, one of the biggest construction jobs in Jacksonville is the $15-million Downtown Center. It will include a 16-story office building, a 6-story department store and a medical building. Park Central, a 400-car garage, is the first completed unit.

• **Expressway reverberations**—The Jacksonville Expressway is a 45-mile highway system that will require more study, more construction. For, as it creates heavier and different traffic patterns, new bottlenecks develop. The Matthews Bridge, for example, was designed for 80,000 vehicles a day; but traffic has



JACKSONVILLE—Future growth hinges on annexation of areas surrounding city.

NEW CITY HALL (left) joins County Courthouse near new municipal parking lot.

EXPRESSWAY north bisects city.

already hit 64,000. So a unique interchange is under way in the Gator Bowl area to help speed traffic. This $1.5-million interchange is the sixth major interchange inside the city's 30-sq mi limits.

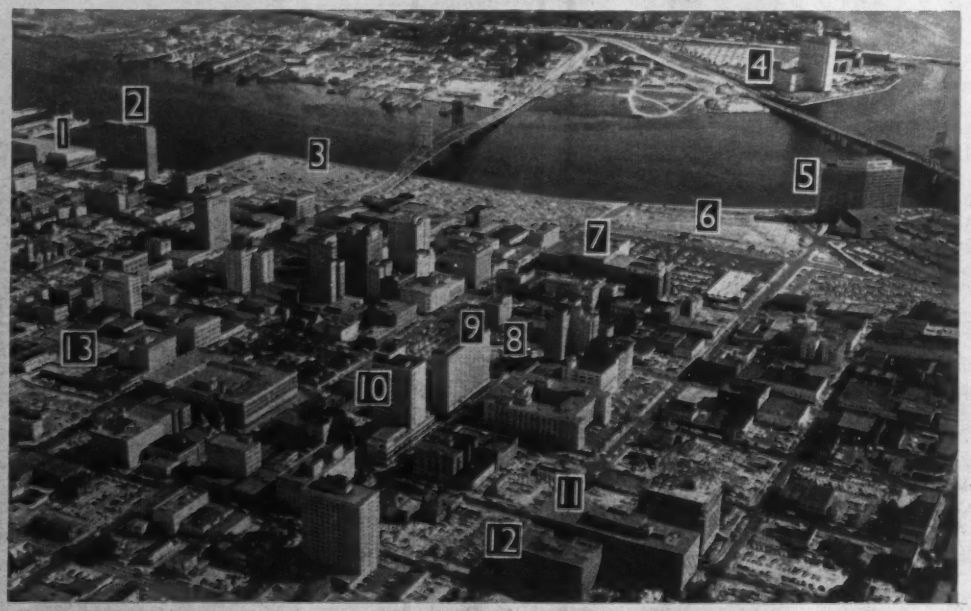
Outside the city limits the suburbs flourish as industrial sites. Along with a flood of small industries newly established near the expressway, a number of large corporations are moving into the Gateway area. International Business Machines, Reynolds Metals, General Electric, Kaiser Gypsum and Gulf Oil and Refining are typical of the big corporate interests that have plans for the Jacksonville area.

So many industries have settled near the expressway that 87% of its traffic is local.

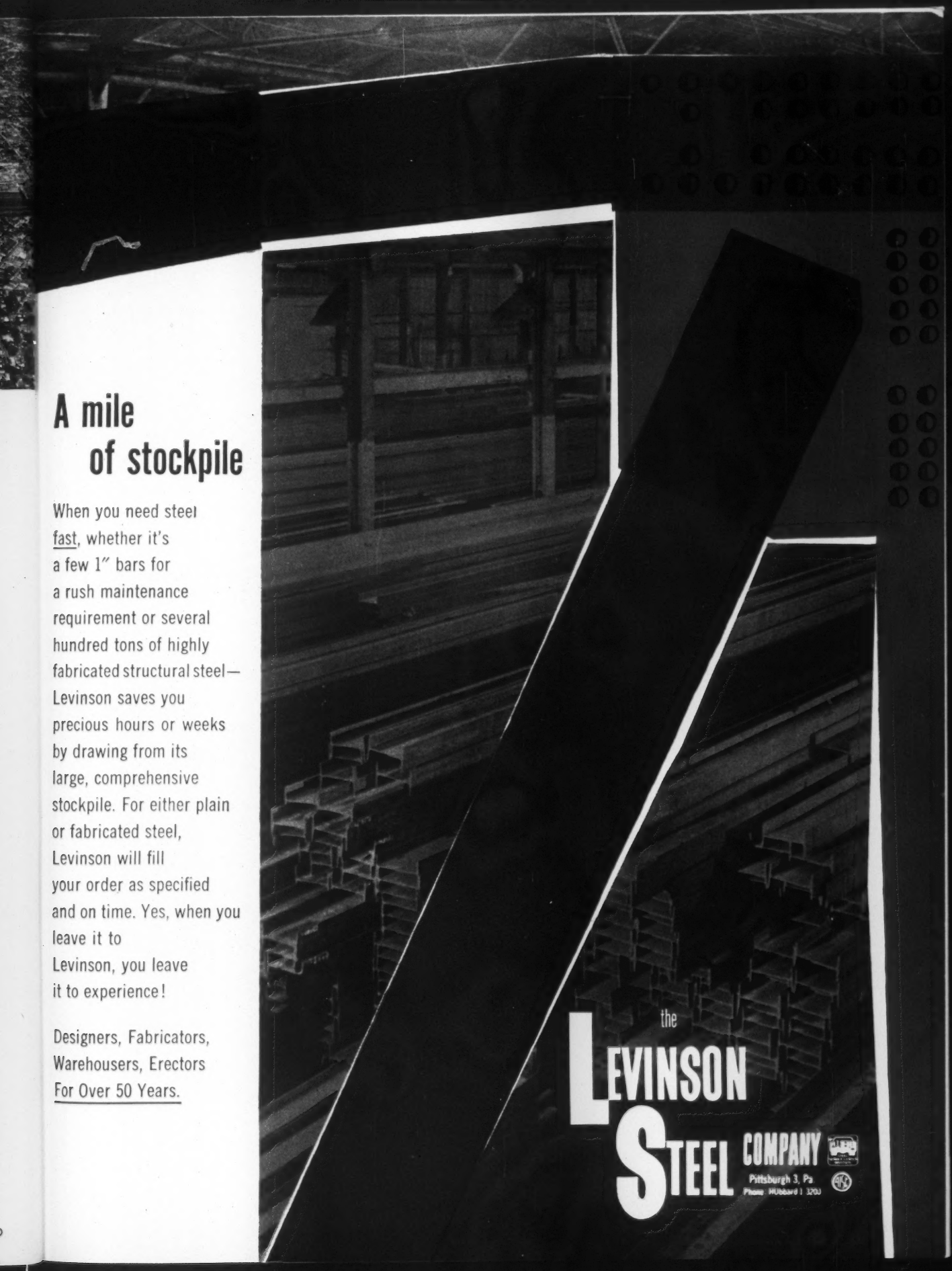
The original estimate of the cost of the expressway was $41,818,000. In January, 1957, the project was refinanced by a bond issue for $70 million. Now, the total cost of the expressway approaches $100 million, with 60% of

(Story continued on p. 35)

Major Projects Rebuilding Jacksonville:



1 — Duval County Court House
2 — City Hall
3 — Municipal Parking Lot
4 — Prudential Insurance Building
5 — Atlantic Coast Line Railroad Building
6 — Site of City Auditorium
7 — Sears, Roebuck & Co. Store
8 — Site of Florida National Bank Building and Garage (now, nearly completed)
9 — Robert Meyer Hotel
10 — Independent Life Insurance Building
11 — The Jacobs Building
12 — The 400 Building
13 — Downtown Center (under construction)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*NATURE OF BUSINESS _____ 11/16/61

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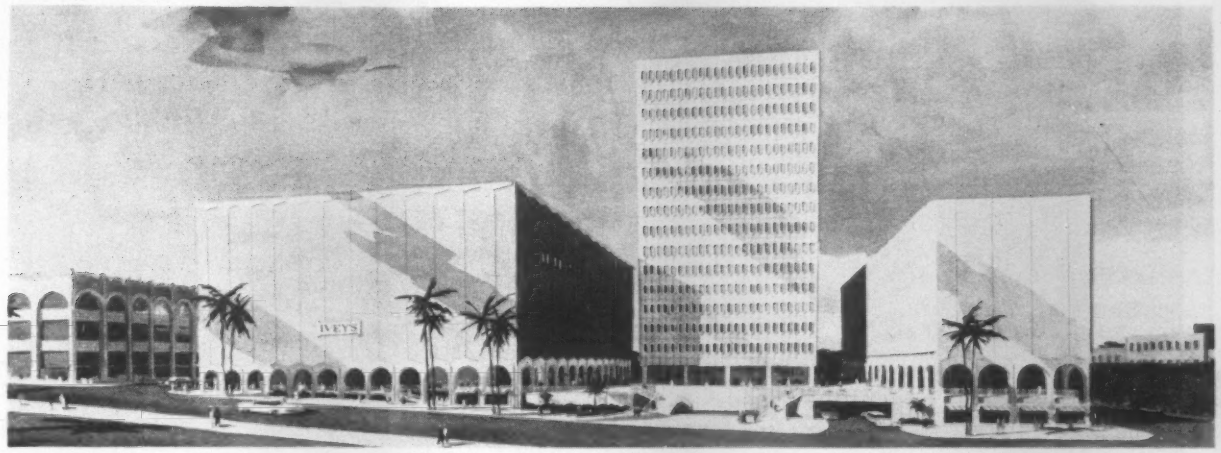


DOWNTOWN CENTER, now under way, will include a department store (left), office building (center) and a medical building.

that apportioned for construction and 40% for rights-of-way. Additional funds for maintenance and bond redemption come from three new toll bridges.

• **Public dollars and sense**—Although it would be wrong to say that Jacksonville's renewal is a direct result of its form of government, its recently streamlined governmental system makes it easier for the city to make construction contracts.

Prior to 1951, the executive powers of the mayor were separated from the administrative powers of the City Commission. But in 1951, Jacksonville brought the offices of the mayor and the Commission into closer working harmony by making the mayor the permanent chairman of the Commission.

Now, the mayor and the commissioners are jointly responsible for spending the money raised by the City Council, the legislative body. The mayor and the commissioners have "the exclusive power" to supervise and control construction and maintenance of public buildings, streets, sewers, bridges, etc.

This does not include the Jacksonville Expressway, which is administered by the Expressway Authority.

Here's a sample of how the city stimulates municipal construction.

In 1957, the city sold a $30-million improvement revenue issue, backed by a newly levied 10% tax on all purchased utility services. Part of the tax levy went to pay off the bond issue. The remaining tax and bond revenue was used to construct the city hall and coliseum, and $6 million went into street and paving improvements.

Last year, another $30 million in bonds was sold; this time for electric utility equipment and construction. Waterfront development bonds, auditorium construction bonds and other improvement bonds helped bring the city's outstanding revenue certificates (total debt) to a total of $102,906,328 at the close of last year. The city's debt service requirements on all revenue certificates totaled $6,3[illegible]6,323 for this year; they will probably jump to $9 million next year.

Harsh critics cry that Jacksonville has mortgaged its future. That's precisely the point. Jacksonville is thinking of the future, and it is not afraid to accept financial obligations today to build for tomorrow.

Jacksonville's annual net income is over $28 million. The bulk of this comes from such sources as the municipally owned electric and water utilities, docks and parking lots. With a book value of $118,593,763, the electric company grossed over $33 million last year. And, as a Jacksonville first, the electric company also turned in $12 million to the city for reduction of taxes.

• **Private interest**—Stimulated by the urban renewal policy of the U. S. Chamber of Commerce, Jacksonville's Chamber has established a cooperative working atmosphere between public and private interests. Private builder-investors have greatly contributed to the city's renewal. But the nonfinancial assistance of the Chamber's local committees is also an important factor in Jacksonville's growth.

The state tax dispensation that lured insurance companies into Jacksonville, for example, was expedited by the Chamber's Committee of 100. To encourage growth of retail stores, the Downtown Committee of the Chamber operates a free bus service.

One of the latest contributions of the Chamber was stimulated by William K. Jackson, of the architectural firm of Kemp, Bunch and Jackson. He worked for two years to bring about the establishment of a planning board in Jacksonville. Last June, an enabling act was passed that established the Jacksonville-Duval County Area Planning Board. The prime purpose of the board, not yet activated, will be to smooth out joint problems of the urban and suburban areas.

• **More construction to come**—With the growth of such areas as the Mayport Naval Station, Jacksonville University and the suburbs east of the Intercoastal Waterway, comes the necessity for more highway expansion.

The Expressway Authority has already declared that a new bridge is needed to serve the Mayport area, and that a bridge across the Inland Waterway will probably be needed.

City officials look forward to the day when Jacksonville will expand its city limits from 30 sq miles to about 95. This annexation will open four new areas for civic improvements and raise Jacksonville's population above that of Tampa and Miami.

Other municipal plans include a library, a 9-block-long highway along the north shore and a park.

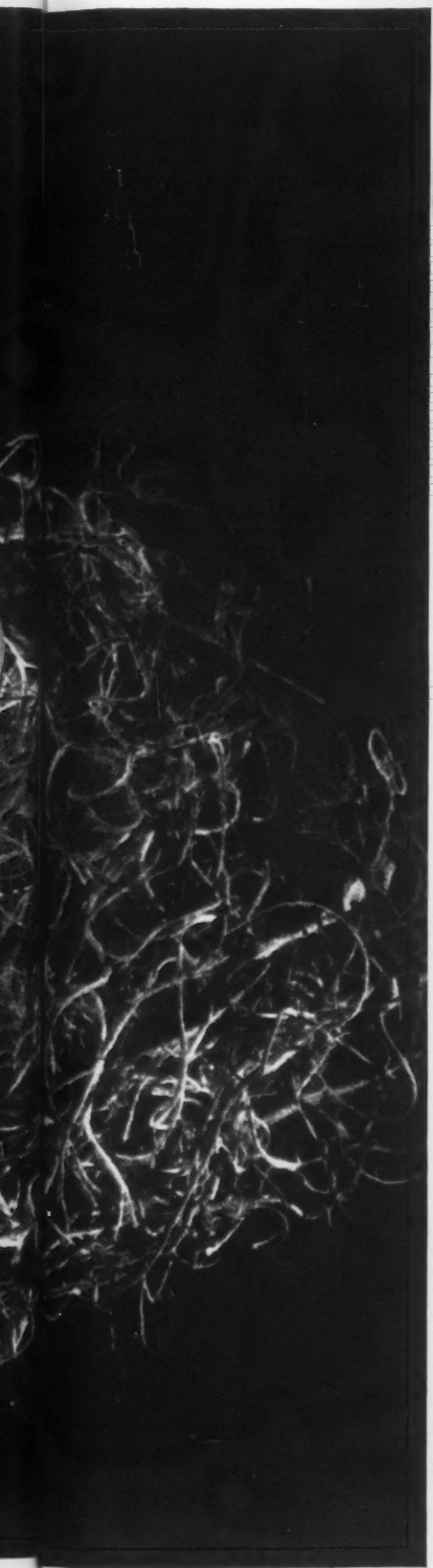
Federal plans, announced by the General Services Administration, call for an $11-million building. GSA already has the funds and is seeking a site for the 13-story office building.

In Jacksonville's near future is also the possibility of a $22-million airport.

As Jacksonville plans more improvements, it has the pattern of its recent renewal as a guide for future development. This pattern, a lofty precedence of financial independence, is best summarized by Mayor Hayden Burns:

"The present status of the Jacksonville story of urban renewal and redevelopment is a tribute to every person who made a contribution to it. With this flood of construction and other payrolls, our people haven't known what the so-called recession was about, but what we do know is that ours is a new and attractive city with which we are all pleased. The greatest pride, though, comes from knowing that we have done it ourselves."

ASPHALT
CONCRETE



DON'T COUNT YOUR TEST ROADS BEFORE THEY HATCH

Oklahoma's test road, just north of Oklahoma City, is the latest publicly financed test road to be exploited by promoters of slab pavements before the test has been completed and the results evaluated by its sponsors.

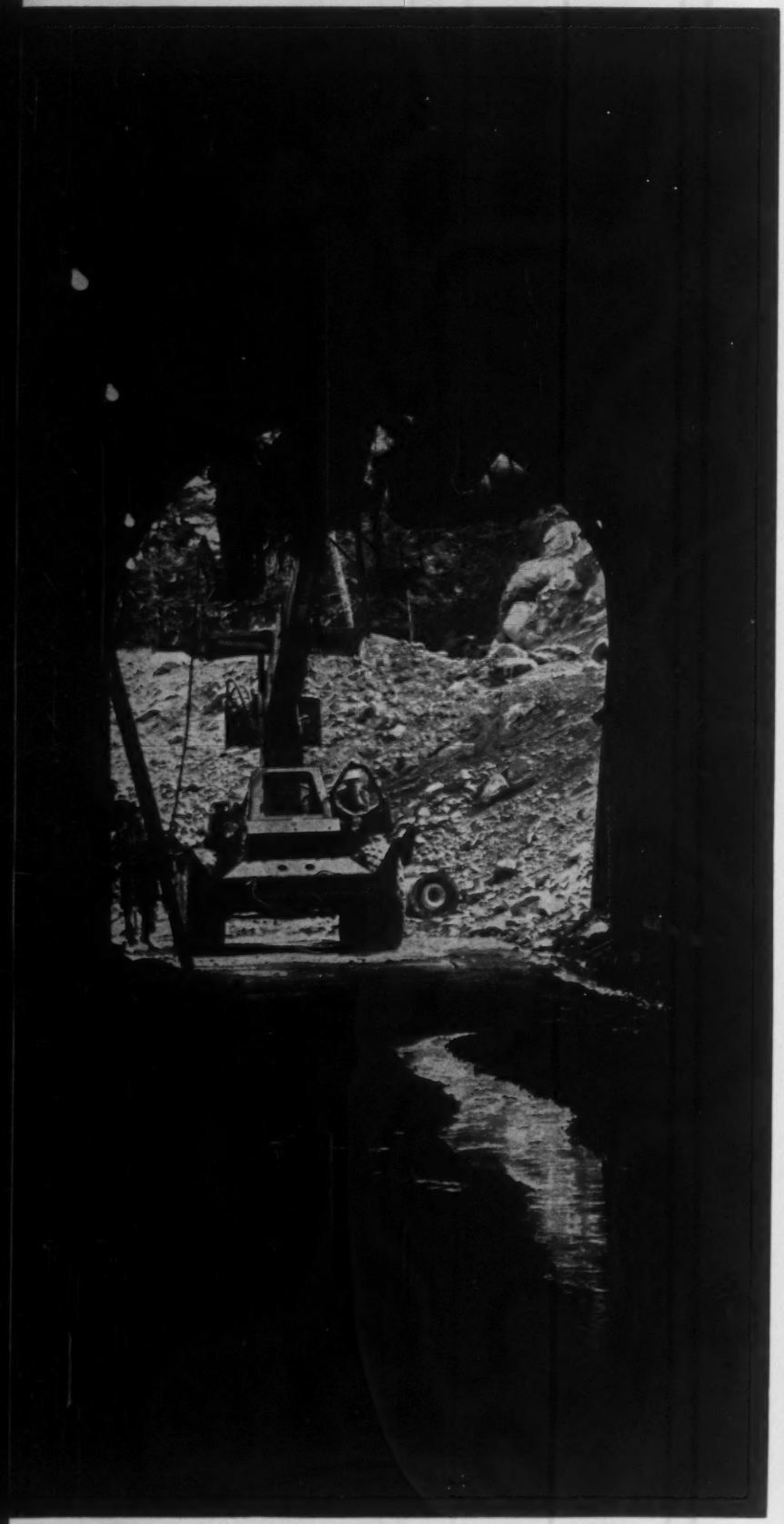
Oklahoma highway engineers know what they are doing. No engineer who knows the facts about the Oklahoma test road will be taken in by such exploitation.

The test of a pavement is its performance over many years. The facts on the four-mile Oklahoma Test Road are that the Asphalt pavement saved Oklahoma taxpayers $103,494.37 in original construction costs. These initial savings will more than cover all present and future betterment and maintenance costs; meanwhile providing Oklahomans with a stronger pavement and a brand-new riding surface.

Time-tested, time-proved Asphalt pavements are pavements of integrity. Once an Asphalt highway, always an Asphalt highway. Not so with rigid surfaces. When concrete highways become too expensive to maintain, often in less than 18 years, they're covered over with Asphalt and lost forever on the maintenance records as a concrete pavement.

Concrete roads become Asphalt-paved eventually. Total Asphalt construction **in the first place** does the job better, at less cost, and with periodic betterments provides a safer, smoother-riding, easier-to-drive pavement over 50 years.

THE ASPHALT INSTITUTE, College Park, Maryland



Arch-roof tunnel leads to new air defense command center.

Builders

Men of Utah Construction Co. are battling two major enemies—time and weather—to rush completion of the first phase of work on the $60-million underground headquarters of the North American Air Defense Command (NORAD) (ENR Mar. 30, p. 19).

NORAD's new command center will be blasted out of solid granite in the base of Cheyenne Mountain, near Colorado Springs, Colo. The vital headquarters will lie about 1,400 ft below the top of the mountain.

Time is a factor, since Utah must—among other things in its $5.9-million contract—excavate nearly ½ million cu yd of rock in 365 days, with a $1,250 penalty for every day beyond the completion date. Work on the project began May 18, 1961.

Even though most of the work is underground, weather is a factor. During the summer months, Cheyenne Mountain seems to serve as one big lightning rod for the numerous electrical storms that hit the area. Lightning plays havoc with blasting operations. As a safety precaution, Utah stops loading or shooting whenever an electrical storm is nearby. Last summer many delays of from 1 to 12 hours resulted.

Colorado's winter weather, down to 40 below zero and lots of snow, is expected to complicate supply problems.

• **Access road**—First step for the contractor was repair of the access road to the tunnel site, plus preparatory work at the portals of the north and south access tunnels. The road is the "Million-Dollar Road to Nowhere" (ENR Dec. 17, 1959, p. 46).

The two-lane gravel road branches off Colorado route 115, south of Colorado Springs, opposite one of the main gates of sprawling Fort Carson. It climbs gradually for 2½ miles up the approaches to the mountain, then forks; one leg goes some 4,900 ft to the south portal, the other about 3,600 ft to the north portal. The portals are about 1,200 ft higher than the beginning of the road.

• **Access tunnels**—The south, central and north access tunnels form a long, looping bore connecting the two portals with the underground chambers that will house the command center. All three tunnels have arched roofs.

The south tunnel is about 2,630 ft long, 15 ft wide and 17 ft 6 in. high (height to the spring line is 10 ft). The north tunnel is about 1,220 ft long, 29 ft wide and 22 ft 6 in. high. The 850-ft long central access tunnel is nearly a

Blast Out Underground Fortress

true semi-circular arch; bottom width is 45 ft, height 25 ft.

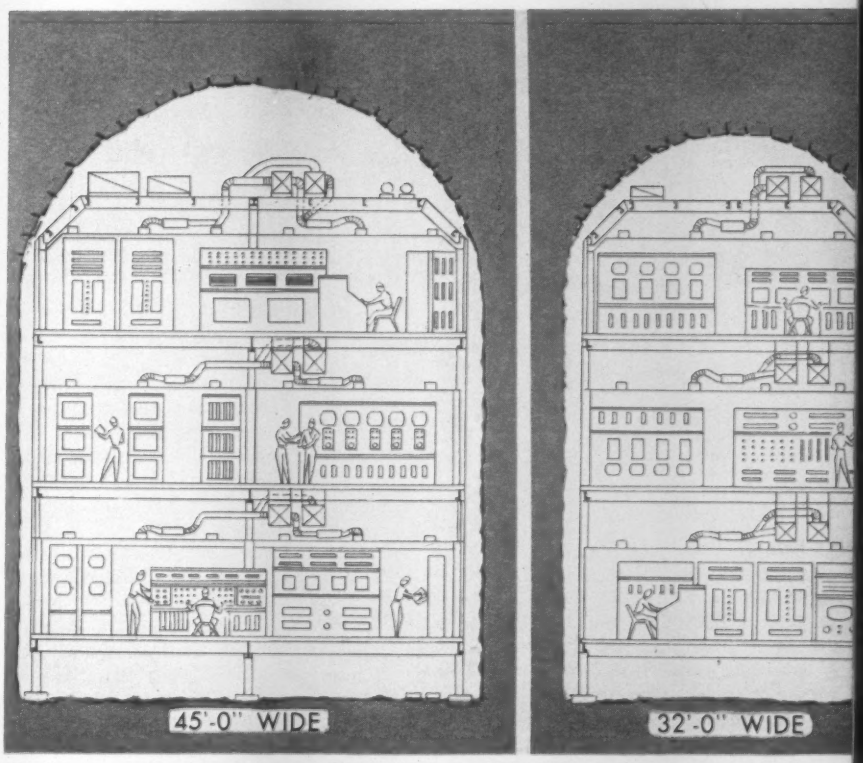
Designers specified concrete lining for the first 300 ft of the south tunnel; 250 ft of the north tunnel. In other portions, the contractor will install 6- and 8-ft rock bolts in the tunnel roof as necessary for adequate support. Fault zones will be reinforced with steel ribs and pneumatically applied concrete. Blast doors in the adits will protect the chambers. The south and north access tunnels will have reinforced concrete portals.

Utah is driving the south tunnel with a rubber-tired, six drill jumbo working the full face of the tunnel. Working three shifts, the contractor has drilled and blasted 55 ft in one day (11 ft per blast). Hoped-for progress is 66 ft per day in unlined sections.

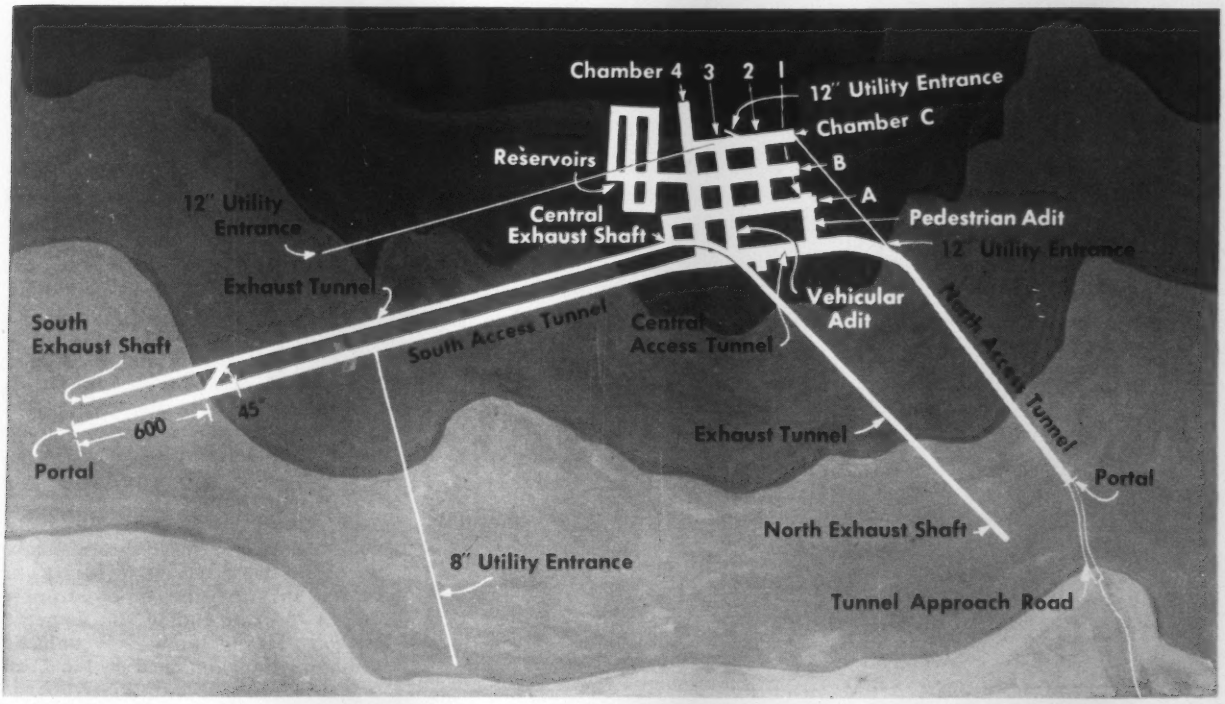
The contractor is using twin, two-platform, rubber-tired jumbos to drive the larger north tunnel. Platforms are adjustable in height. Progress is scheduled at the rate of 35 ft per day, working the full face.

Mucking was the major problem in early phases of driving the north tunnel. Conventional mucking machines were having trouble keeping up. On the job on a trial basis is a new machine, the

(Please turn the page)



Underground chambers will house steel buildings, equipment.



Labyrinth of tunnels and chambers is being carved from solid rock in base of mountain.

TWIN pneumatic-tired drilling jumbos attack rock face in north access tunnel. Tunnel section is 29 ft wide, 22 ft 6 in. high.

Gatescavator, that is said to be able to muck 500 cu yd per hour.

The new rig is 12 ft 6 in. high, 12 ft 8 in. wide and nearly 43 ft long. It has a 260-hp diesel engine, hydraulic transmission with electric control and a direct drive hydraulic motor in each of its four wheels. Material loaded by a tilting bucket on a telescoping boom at the front of the machine falls on to a 36-in. belt conveyor, passes over the body of the machine and drops on to a power-swung tail conveyor to load hauling units.

• **Chambers and reservoirs**—The NORAD battle center will be housed in a three story steel structure built within a series of interconnecting chambers. The main building will have nearly 200,000 sq ft of floor space.

The facility is designed to accommodate a maximum of about 700 persons. It is intended to be impregnable to air attack, capable of sustained, continuous operation without outside utility, logistic or personnel support.

A principal portion of Utah Construction's work is the excavation of the large chambers, which are interconnected by adits to the central access tunnel and smaller cross chambers (see drawing).

The typical large chamber is an arch section 45 ft wide, 60 ft high and about 130 ft long. One large chamber, for the power plant, is 50 ft wide, 56 ft high and about 130 ft long. Typical smaller cross chambers are 32 ft wide, 56 ft high and 145 ft long.

The roof of each large chamber will be covered by chain link fabric pinned to the rock by bolts and plate washers.

Air intake, pedestrian and vehicular adits are smaller still; the latter are 32 ft wide and 25 ft high.

Additional adits connect the working chambers to "industrial" and "domestic" reservoirs, and to a central exhaust shaft. Reservoirs will be arch sections, 32 ft wide and 16 ft high. A small chamber will be used for storage of fuel oil. Three small utility shafts terminate in the roof of large chambers at the rear of the underground fortress; another penetrates the south access tunnel.

In planning the excavation of the chambers and reservoirs, the contractor faced two major problems—the method of drilling and the handling of transitions from one size of excavation to another.

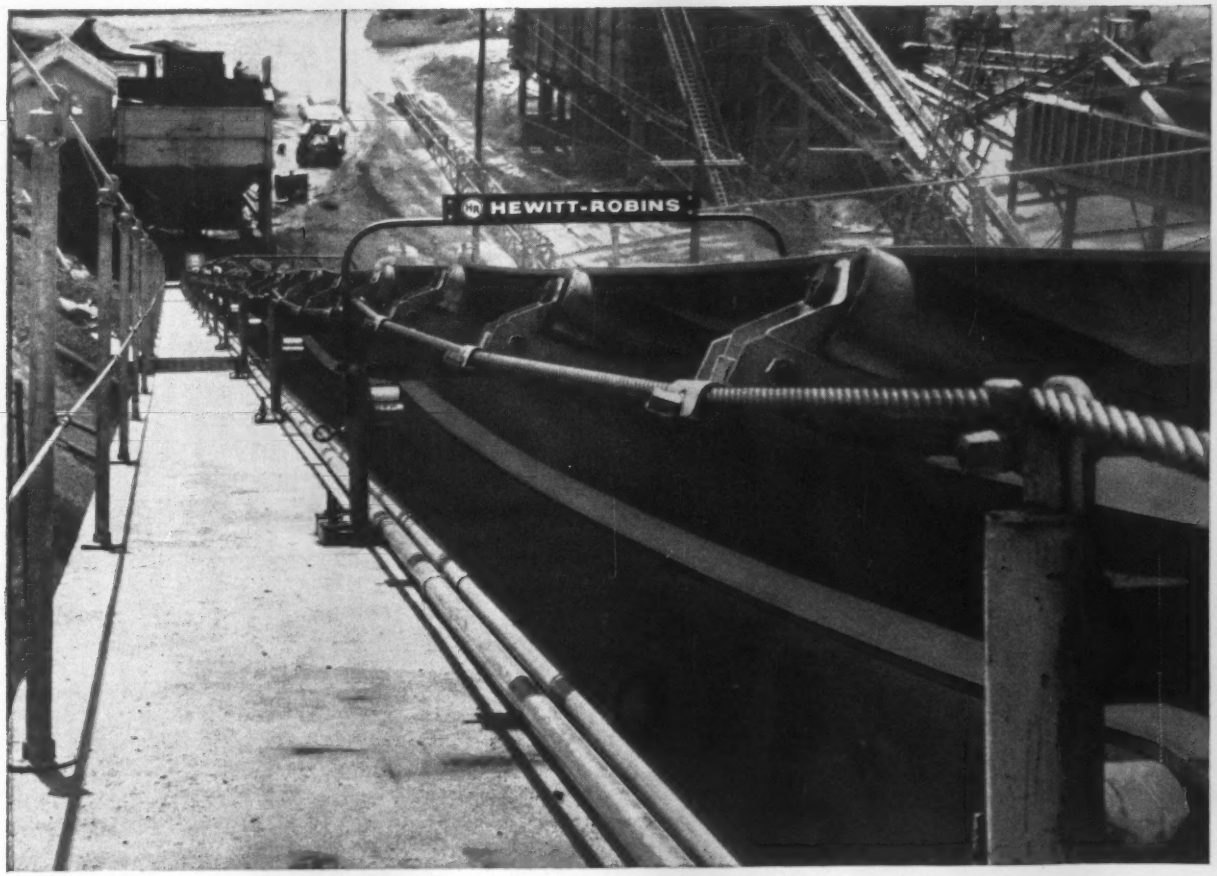
The contractor is studying three methods for chamber excavation. One of these is conventional percussion drilling, such as is done in the access tunnels. Another is a long-hole method with diamond drills, which would involve driving pilot tunnels through the chambers, cutting stations every 150 ft, then drilling long holes both ways from each station.

A third method would be to drive a top heading 45 ft wide and 29 ft high, then take the bottom 31 ft out with down holes. This approach appears to be the most economical, and is the one that probably will be used.

Handling the transitions, particularly those within the reservoir area, will be rough, says Cecil B. Welton, Utah's project manager. Utah expects to take care of the transitions by driving a 60-ft access tunnel from the end of Chamber "A" to the east end of the domestic reservoir. This procedure will eliminate turning of the equipment in the small transitions to the adit and reservoirs.

(Continued on page 44)

HIGH SPEED mucking machine got a trial on Cheyenne Mountain job.



Down go your costs
with an H-R Wire Rope Conveyor!

Here is the simplest, most efficient conveyor construction you could imagine . . . an H-R wire rope conveyor. The initial cost is significantly less than other constructions. New H-R Style L idlers (pat. pend.) and wire rope design allows 13% greater load-carrying capacity, absorbs shock and impact, and thus increases belt and idler life and lessens spillage considerably.

Engineering costs are kept to a minimum because H-R modular designed components fit together like building blocks. This allows greater flexibility in selecting a conveyor for a specific application without intricate engineering.

Another point in your favor; H-R is the only manufacturer of *both* belt and major machinery components of a conveyor. This single-source responsibility is your best assurance of quality.

See an H-R wire rope conveyor in action . . . above or below ground; call your H-R field engineer, or write Hewitt-Robins, Stamford, Connecticut to arrange an inspection tour.

Write for complete facts, installation data. Bulletin 11-60.

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Conveyor Machinery and Belting • Power Transmission
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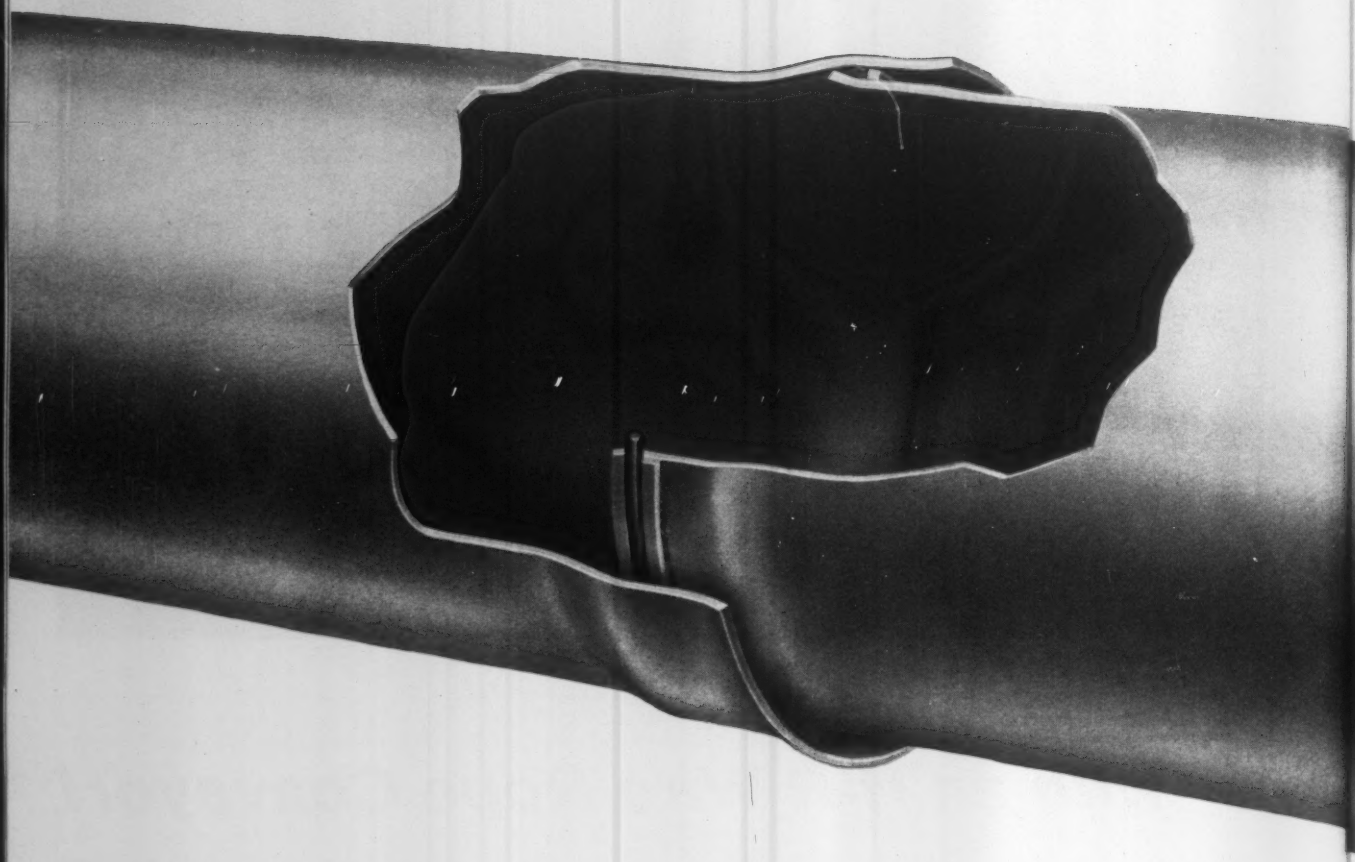
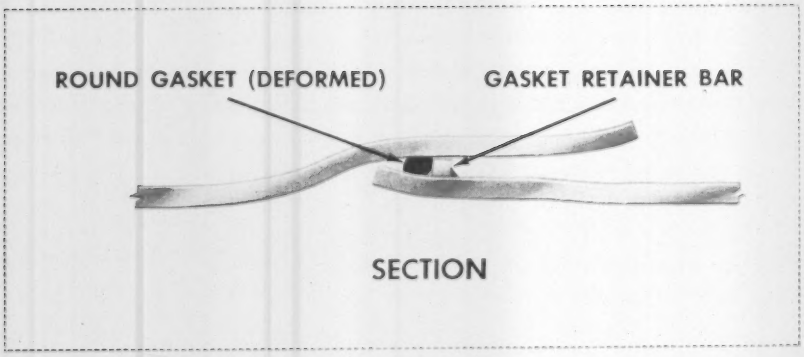
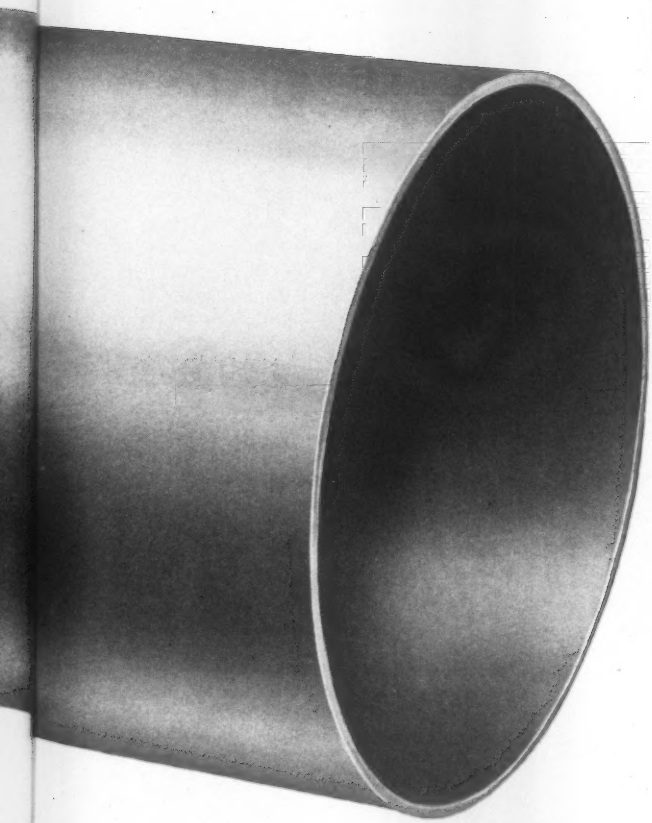




SECTION

Introducing Bethlehem's Bell-and-Spigot Joint, with Gasket



Here's a joint that promises new ease and speed of installation, added to the many well-known advantages of *steel* pipe.

We make it in diameters from 24 in. through 120 in., but if you have something a little smaller or larger in mind, let's talk it over.

And this joint is *tight*. We've tested it to over 450 psi (more than double ordinary working pressures) *and it didn't leak a drop.*

We can line and coat the pipe at the shop with top-quality coal-tar enamel, and wrap it if desired. This gives you the best, longest-lasting protection that money can buy, plus high flow capacity. But if other coating combinations are preferred, we'll supply the pipe to comply.

As with all steel pipe, every single 40-ft length undergoes a hydrostatic test well in excess of the design working pressure.

If you're thinking about installing a large-diameter water main, let us give you more information about our new Bell-and-Spigot Pipe. We suggest that you have a talk with the people at the Bethlehem sales office nearest you.

Steel

for Strength
. . . Economy
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BETHLEHEM STEEL

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ANOTHER PROBLEM SOLVED BY SPENCER, WHITE & PRENTIS

SHEETING, BRACING, UNDERPINNING used for foundation of one of Jacksonville's largest hotels

1. SOLDIER BEAMS, HORIZONTAL SHEETING AND BRACING
2. EXISTING BUILDING UNDERPINNED

Project: Robert Meyer Hotel, Jacksonville, Fla.
Architect: William B. Tabler, New York City
Engineers: Seelye, Stevenson, Value & Knecht, New York City
General Contractor: Daniel Construction Co., Jacksonville, Fla.

The site of this 19-story, half-block-square hotel in Jacksonville was nearly all sand. The foundation required several kinds of specialized work, which were awarded to Spencer, White & Prentis.

Soldier beams, horizontal sheeting and bracing (see photo) were used on 3 sides. This type of support made it unnecessary to cope with heavy hydrostatic pressure, since the openings between the sheeting permitted drainage during Florida's tropical storms.

Pit underpinning secured the J. C. Penney building, at right.

Whatever your foundation problem and wherever your job is located – whether South, North, East or West – Spencer, White & Prentis is equipped to give complete dependable service.

CATALOGUE ON REQUEST

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Foundations Piling Underpinning Shoring Cofferdams Special Services

• **Exhaust shaft and utility entrances**– The exhaust shaft is a 4,500-ft long, looping tunnel comprising two long sloping tangents connected by a short horizontal curve. It lies high above the chambers in the building and storage areas.

The 12-ft-diameter tunnel terminates at each end in a vertical shaft that intersects the main tunnel about 60 ft below ground level. A similar vertical shaft extends downward from the central section of the exhaust tunnel to connect with the building and storage area.

At the north end of the contractor will begin excavation on the outside of the mountain, driving the tunnel in a continuous straight line. Later, crews will plug the outer 50 ft of the tunnel with concrete. At the south end, the contractor will reach the level of the exhaust tunnel by driving a cross tunnel at 45 deg from the south access tunnel. The cross tunnel will begin 600 ft inside the entrance to the south tunnel.

Utah plans to drill the exhaust tunnel by percussion drilling from a rail-mounted jumbo.

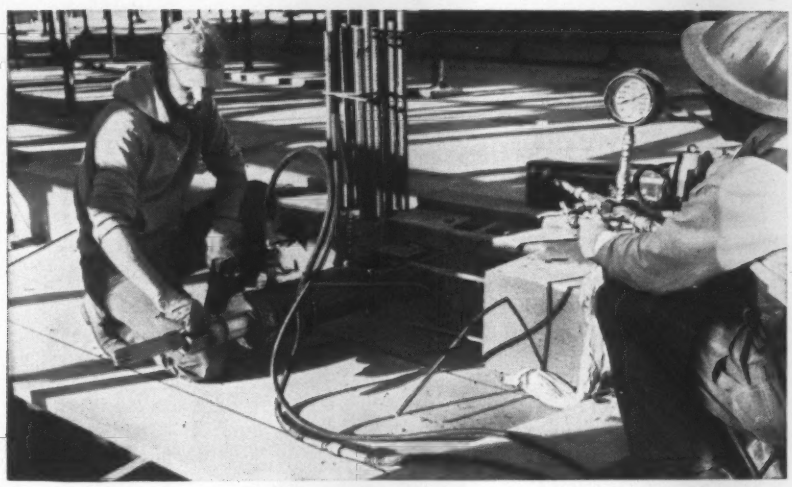
The three 12-in.-diameter utility entrances pose a special challenge to the contractor. Each begins at a point on the rocky mountainside high above the man-made cave, extends in an angling straight line to penetrate the roof of a large chamber at a specified location. Drilling specifications set up by the Corps of Engineers are tight—5 deg tolerance on the angle and hit the target within a circle 12 ft in diam.

These holes vary in length from about 1,200 ft to 1,800 ft. One, for example, begins at an elevation of about 8,520 ft, dives downward at an angle slightly off the vertical to hit the chamber roof at an elevation of about 7,080 ft.

Getting to the beginning points and leveling a working platform will be tough on the rocky, boulder-strewn slopes. And the method of drilling is still undecided. Utah Construction Co. engineers are considering the use of an oil-field rotary drilling outfit with a hammer drill (down-the-hole-drill) to do the job.

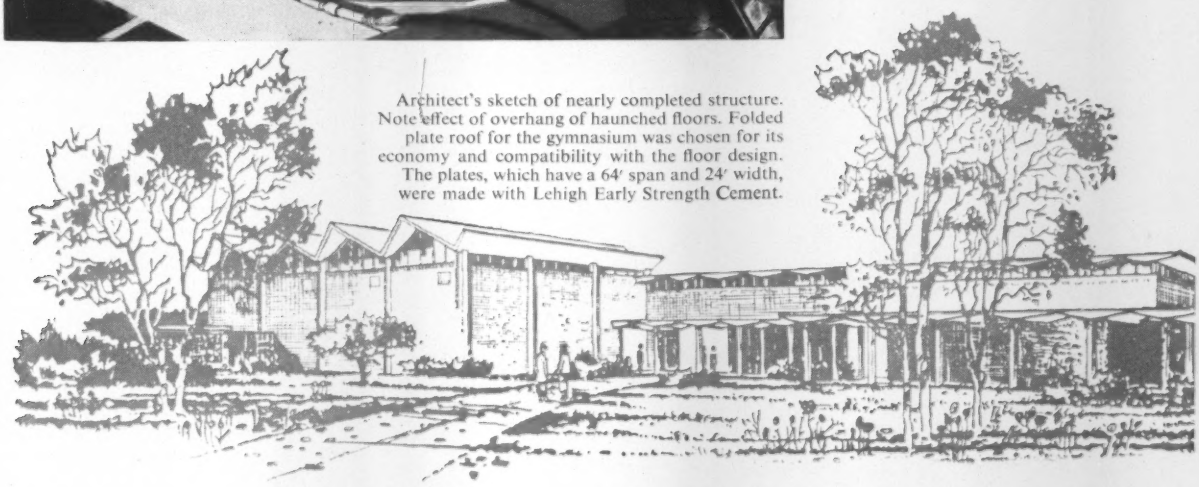
Construction is under the direction of the Omaha District of the Corps of Engineers. Col. H. G. Woodbury Jr. is District Engineer; area field engineer is Lt. Col. John E. Bowman. N. K. Robbins is superintendent for Utah Construction; Dave Davenport is project engineer; Chuck Getz, office manager; and Lou Welton, master mechanic.

Architects-engineers are Parsons, Brinkerhoff, Quade & Douglas of New York City in joint venture with A. J. Ryan & Associates of Denver.



Post-Tensioned Concrete Floors for new school

Floors were poured in sections. As concrete in each section reached 3500 psi, post-tensioning was applied. Thickness of floors varied from 6" to 12".



Architect's sketch of nearly completed structure. Note effect of overhang of haunched floors. Folded plate roof for the gymnasium was chosen for its economy and compatibility with the floor design. The plates, which have a 64′ span and 24′ width, were made with Lehigh Early Strength Cement.

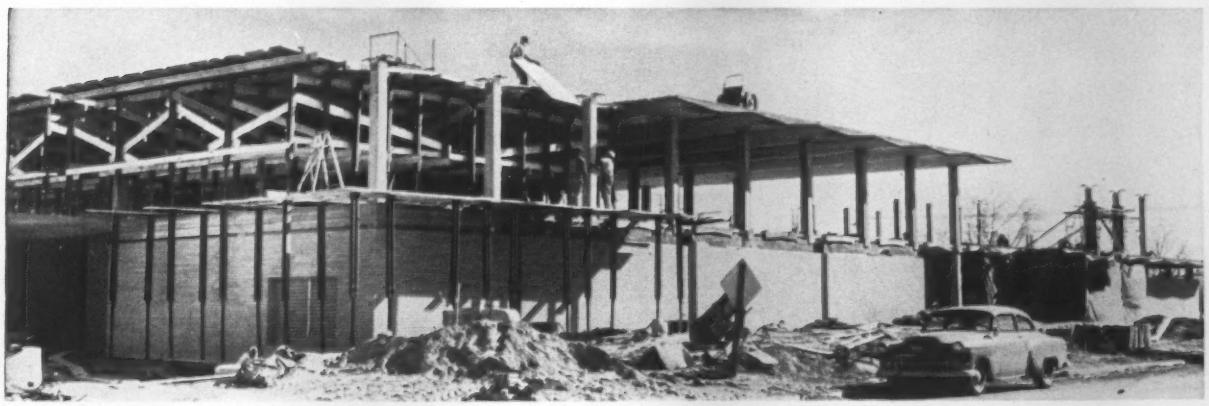
• For both economy and looks, an ingenious floor and roof design was created for Colby, Kansas' new Junior High School. Lightweight post-tensioned haunched slabs made possible a savings in material costs and provided great flexibility in the allocation of floor area. A folded plate roof for the gymnasium adds to the fresh overall appearance of the finished job.

Lehigh Early Strength Cement speeds winter construction. To meet the fast winter construction schedule, the use of early strength cement in the slabs was, in the contractor's words, "The only answer consistent with economy." With Lehigh Early Strength Cement, the slabs reached tensioning strength in one half the usual time, keeping the job on schedule with multiple use of a single set of forms. In addition, the reduced curing time meant savings on *winter* protection costs.

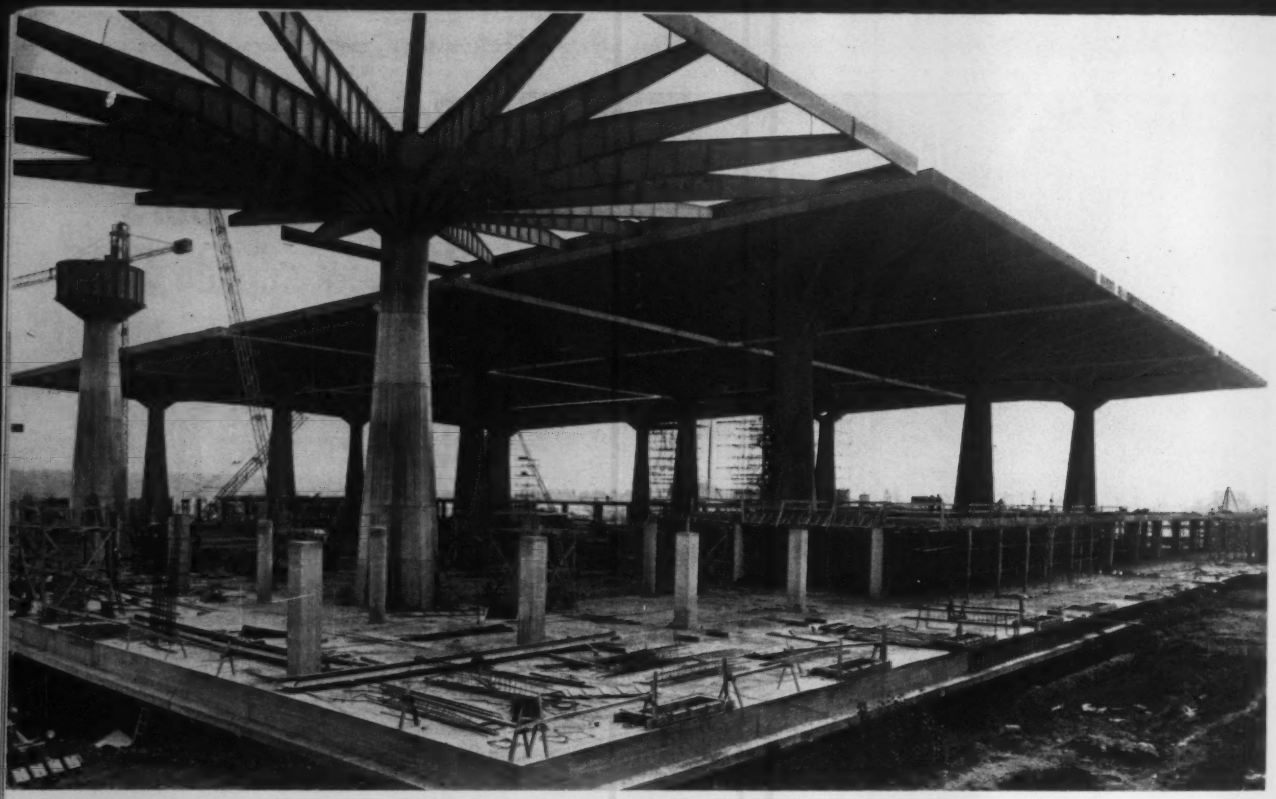
This job is another example of how modern concrete construction and Lehigh Early Strength Cement offer almost unlimited opportunities for design freedom, construction economy and attractive appearance. Lehigh Portland Cement Company, Allentown, Pa.

Architect: Mann and Company, Hutchinson, Kansas
Contractor: L. R. Foy Construction Co., Hutchinson, Kansas

LEHIGH CEMENTS



Concrete for first and second floor and roof was made with a lightweight aggregate and Lehigh Early Strength Cement. The haunched design added to the overall architectural effect as well as contributed to the saving of materials. Lehigh Mortar Cement was used for all masonry.



Separate units of concrete columns and steel roof girders go up in Turin, Italy as . . .

Sixteen Umbrellas Make a Building

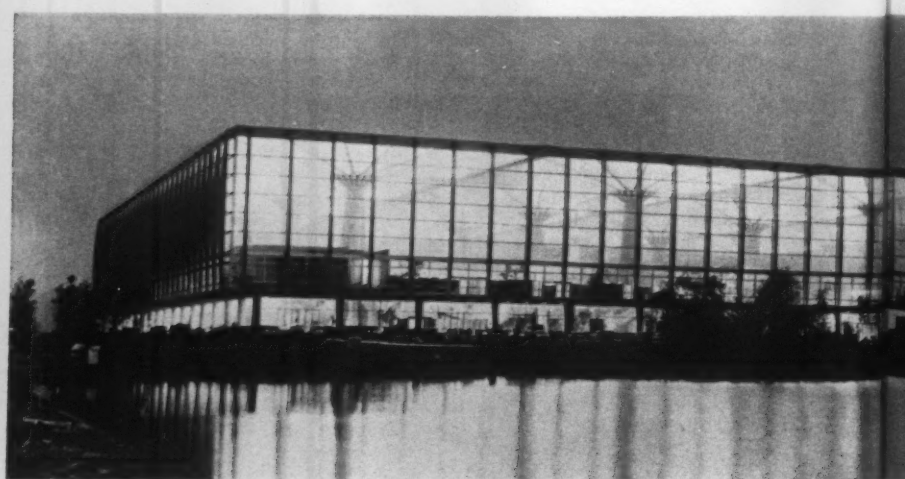
By Waldo G. Bowman

One of the world's notable buildings of 1961 has proved to be as much of an attraction as the exhibits it houses. It is the Labor Palace at the exposition in Turin, Italy, held to celebrate Italy's 100th anniversary as a united nation.

ENR's Editor ***Waldo G. Bowman*** *followed his inspection of Italy's dams (ENR Nov. 2, p. 30) with a visit to Pier Luigi Nervi's remarkable building in Turin.*

Designed and constructed by Italy's famous architect-engineer-builder, Pier Luigi Nervi (ENR April 27, p. 58), the building excites the admiration of visitors with a spectacular and ingenious structural system that imparts architectural nobility and functional efficiency to an enclosed space of some 20 million cu ft.

The one-story and basement building, 520 ft square and 82 ft high from



SUGGESTING TREES IN A GREENHOUSE, the concrete and steel umbrella framing is visible day or night through the great glass

floor to top of roof, is made up of sixteen structurally independent units. Each unit consists of a single, free-standing reinforced concrete column 66 ft high topped by 20 welded steel girders arranged radially to support a 125-ft-square concrete roof. The roof edges of these individual umbrella-like units are spaced 6.5 ft apart, and the resulting slits are roofed over with glass to serve as skylights.

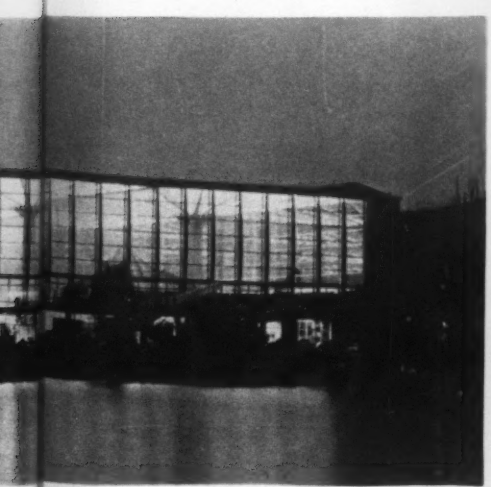
Complementing this unusual structural system is a wall enclosure of glass panes in aluminum frames that calls up further structural ingenuity in the form of hinged vertical struts. These provide wind bracing and partial support for the window frames. The struts are also the dominant architectural element on the outside of the building.

On three of the four walls the struts support horizontal sun louvers. No louvers are used on the fourth wall, on the north, partly because the light from this direction is less intense, but also for the important reason that this side fronts on an artificial lake across which visitors are brought to the building in a monorail train. From this vantage point, the building, either by night or by day, affords an impressive sight. The monorail runs from the gate of the exposition nearly a mile away.

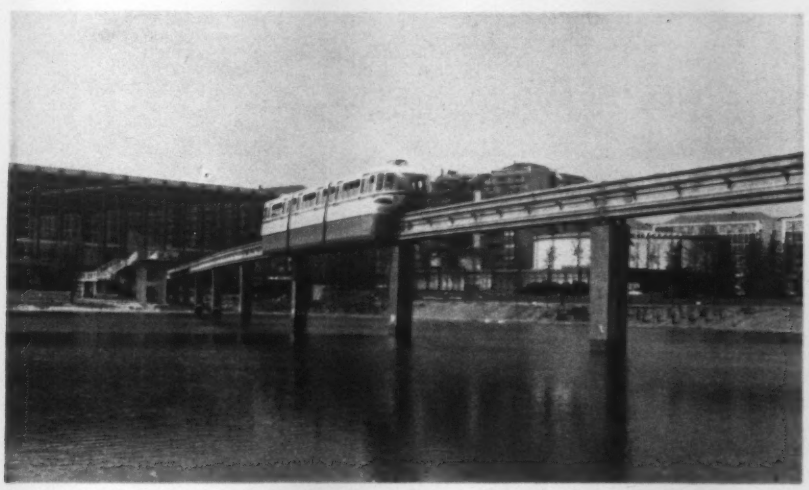
The design of the building, which won out in a competition among five other entries, was dictated both by the intended purpose of the structure and by a requirement for speedy completion. During the exposition the building was to house large-scale educational exhibits of many countries (including the U. S.) depicting the contributions of human labor to the development of modern civilization; afterwards it should be adaptable to use as an industrial training school or for exhibits of various kinds. The time limit for completion, including design and construction, was 17 months.

(*Continued on page 50*)

HUGE CONCRETE COLUMNS attain record height of 66 ft.



walls of the building.



APPROACH TO THE BUILDING is via a monorail across an artificial lake.

Now there's a
Mack M Model for

every practical off-highway job...

A year ago two new Mack M Models—a 45-ton six wheeler and 30-ton four wheeler—made their debut to receive an immediate acceptance unprecedented in off-highway operations. Now four additional M's are ready to take their place alongside the trailblazing two—a 15, 18, and 25-ton four wheeler and a 30-ton six wheeler. This pacesetting line of heavy-duty rear dumpers and tractors introduces a new dimension in profitable and practical off-highway hauling.

What's so special about the Mack M Models? To mention but a few features, there's a completely new cab design . . . there are improved new high strength, light-weight, longer-lasting single floor bodies—with or without heated floors . . . there are new Mack axles and bogies . . . there are newly engineered, extra sturdy frames . . . there are power options up to 525 hp to provide the getup and go that meets any challenge.

Most special of all, they're Macks . . . finest products of a line that has worked its way to the front in heavy-duty off-highway service. Add the extra features of the new M Models to Mack's already firmly established reputation for getting the job done at lower operating cost and with minimum downtime, and you come up with the answer to true off-highway efficiency.

To select the right Mack for your own operations, contact your nearest branch or distributor. He's all set to show you what's so special about a Mack. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

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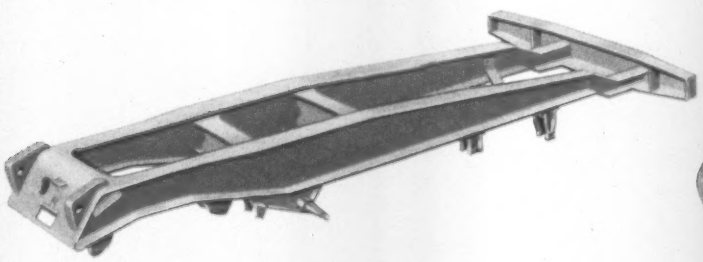
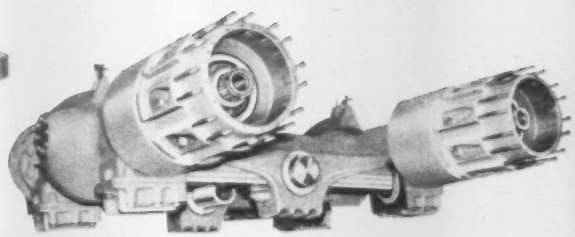
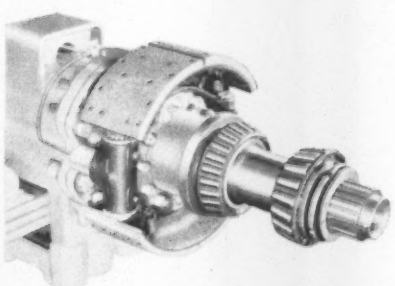


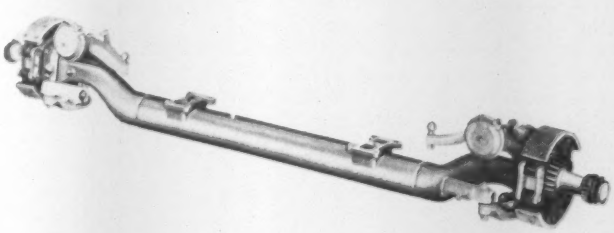
A NEW DIMENSION IN FRAME STRENGTH—Built to shrug off jarring shovel drops, the extra solid, extra strong five-crossmember frame of the M30X Mack is typical of the engineering advances in all M Models. Welded crossmembers, including integral front and rear bumpers, tie alloy steel fabricated I-beam main rails together.



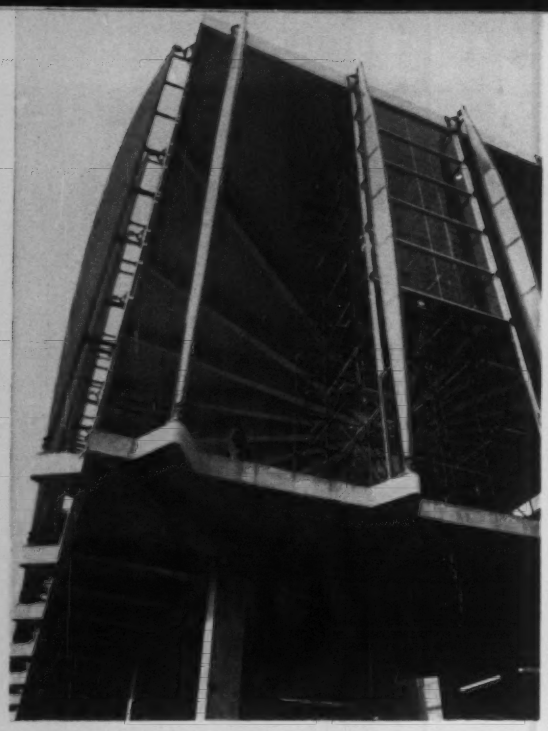
A NEW DIMENSION IN BOGIE PERFORMANCE—Indicative of advances in all Mack M Models, this newly designed heavy-duty twin-axle bogie on six-wheeler M45SX offers the strength and simplicity of straight-through drive and single-reduction carriers with Mack Planidrive reduction at the hubs. Unusual bogie flexibility results in exceptionally long tire life, reduces frame twist and wracking and keeps all wheels equally loaded. Suspension is through walking beam and flat leaf springs.



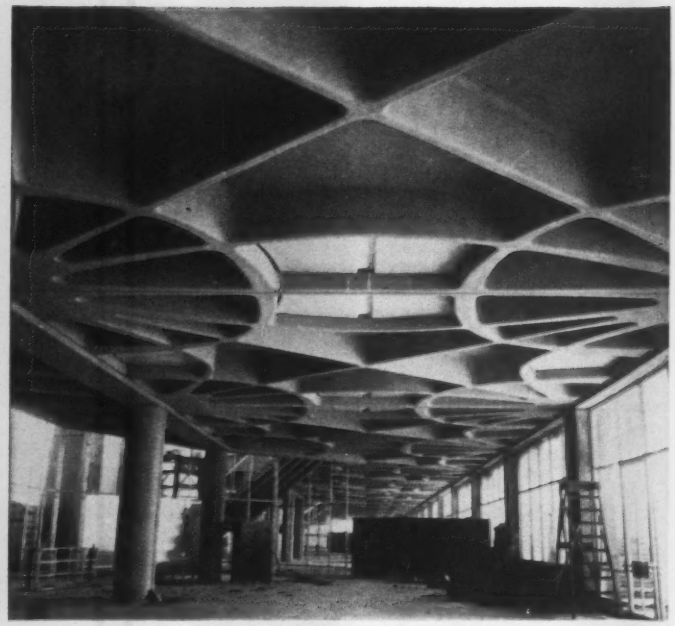
A NEW DIMENSION IN BRAKING SURENESS—Safe, sure braking power for maximum control at all times is another feature of all M Model Macks. Illustrated here is the air hydraulic rear braking assembly for the M30X and M45SX. Front brakes are air; rear are air hydraulic with separate master cylinders for extra safety factor.



A NEW DIMENSION IN FRONT AXLE LOADING—The new tubular front axle, featuring steel tubing seven inches in diameter with walls ¾" thick, provides a reversed-elliot front axle for the M45SX and M30X that easily withstands the additional loading made possible by Mack's new forward cab location.



HINGED STRUTS help support the high glass walls.



BALCONY FLOOR is strengthened by an intricate pattern of ribs.

The key to his solution, Mr. Nervi said, was to avoid covering the large area with a single structure in which a start on the inside finishing work would have to wait on completion of the roof. By using the sixteen separate units, the finishing work could, if necessary, be started as soon as each unit was completed. The time limit also dictated use of structural steel framing for the roofs, after the first studies made in concrete, as is usual in Nervi structures, showed this to be necessary.

Construction was carried out by the Nervi organization's own field crews and equipment. It started with the driving of piles for the sixteen main columns and for a series of small columns that would support a balcony to be built around the perimeter of the building. Work then proceeded, in sequence, to concreting the main columns, constructing the floor together with the balcony columns, erecting the steel roof girders and roof, concreting the balcony floor and enclosing the building in its glass walls.

Concreting the main columns was the most difficult of the operations because of their shape, size and height. From a cruciform shape at the base, contained in a square 16 ft on a side, they taper upward until near the top they attain a circular section 8 ft in diameter. This shape was adopted as offering the best and most efficient disposition of the concrete—always a basic Nervi objective so far as columns are concerned.

Special forms were designed for these columns consisting of a bolted structural steel framework carrying two layers of vertical boards. Six sections of forms were required for a 66-ft-high column, and each section could be broken down into quadrants for erection and stripping.

The forms were readily moved from column to column and produced the surface texture and uniformity of dimensions that were desired. With a hammerhead crane to lift the concrete, which was brought to it by a compressed-air pipeline from a central mixing plant on the job, each main column was completed in about 10 days time.

After the flared-out steel column capital had been set in place over the protruding ends of the column reinforcing rods, additional column concrete was placed to furnish a firm anchorage. Erection of the roof framing then followed, commencing with the installation of a cylindrical member equipped with connections for the steel girders. Once this was in place the girders were lifted with a crawler crane operating on the main floor, and the connections made first by bolting and then by welding. The average construction time for each umbrella was 11 days.

The floor, designed for a live load of 410 psf, is supported by a grid of cast-in-place girders of 33-ft span. Precast beams on 5-ft centers span between the girders and support 4-in. thick precast floor slabs. A truck crane installed the 3-ton precast beams, the slabs were placed by three hammerhead cranes.

The balcony, designed for a live load of 82 psf, consists of a center portion of 33-ft span, with 13-ft cantilevers along both the inside and outside edges. The outside cantilever carries the glass walls of the building and in addition serves as a canopy for an outside walk.

The center portion of the balcony floor is built with 24-in.-deep ribbing arranged in a pattern of straight lines and curves corresponding to the pattern of the principal stresses. These ribs not only give the construction the necessary strength to act as an anchor arm for the cantilevers, but provide a striking architectural effect.

The Nervi organization cast in place the entire balcony framing—ribs and a 4-in. floor slab—using forms of precast concrete that provided surfaces that required no additional finishing. Mobile scaffolding permitted quick shifting of the formwork.

As soon as a sufficient portion of the balcony floor was complete, erection of the framework for the glass walls began. This started with the installation of the vertical struts. Behind, and attached to them at 7.5-ft intervals, are the vertical mullions of the window frames into which the panes of glass were finally fitted.

The struts, placed on 16.5-ft centers, are 62 ft high and have a hollow section fabricated from welded steel. The section increases in depth from the ends to the middle, assuming the outline of the moment diagram for a simply supported beam. A rocker bearing at the bottom on the balcony and a swivel detail at the top where the strut joins the roof provide the hinged connections necessary for this condition.

Assisting Mr. Nervi on the Labor Palace were his two sons, Antonio, who contributed to the design, and Mario, who directed the job in the field. The designer of the structural steel portions of the building was Gino Covre.

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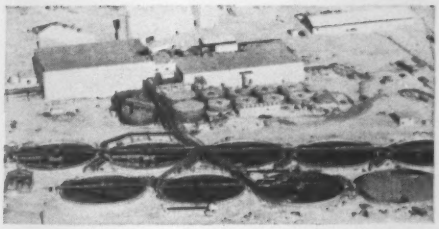

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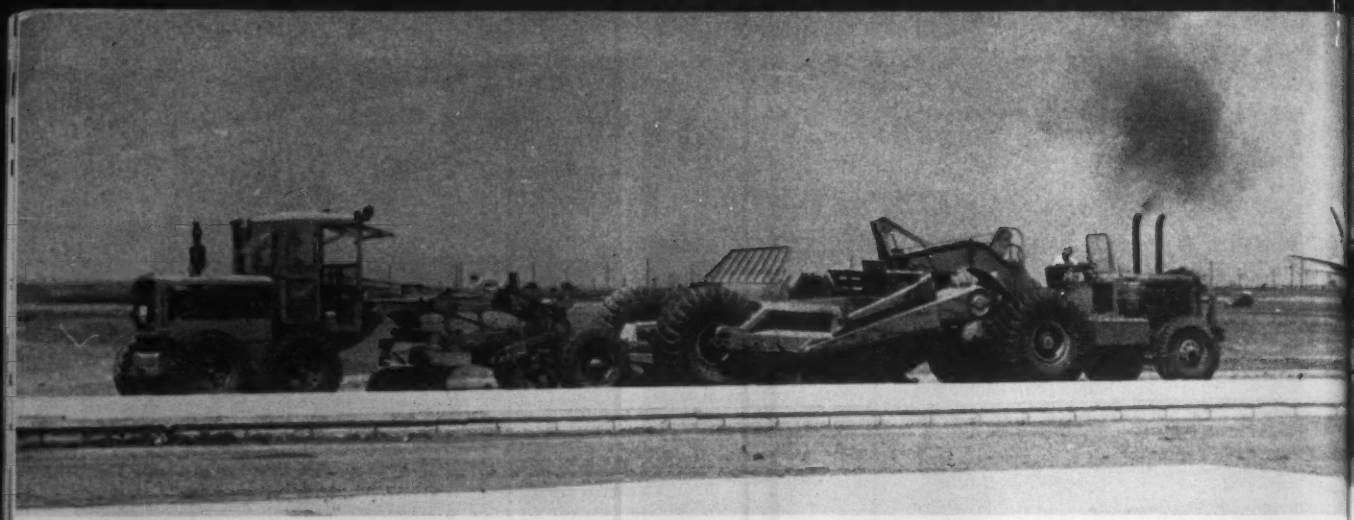
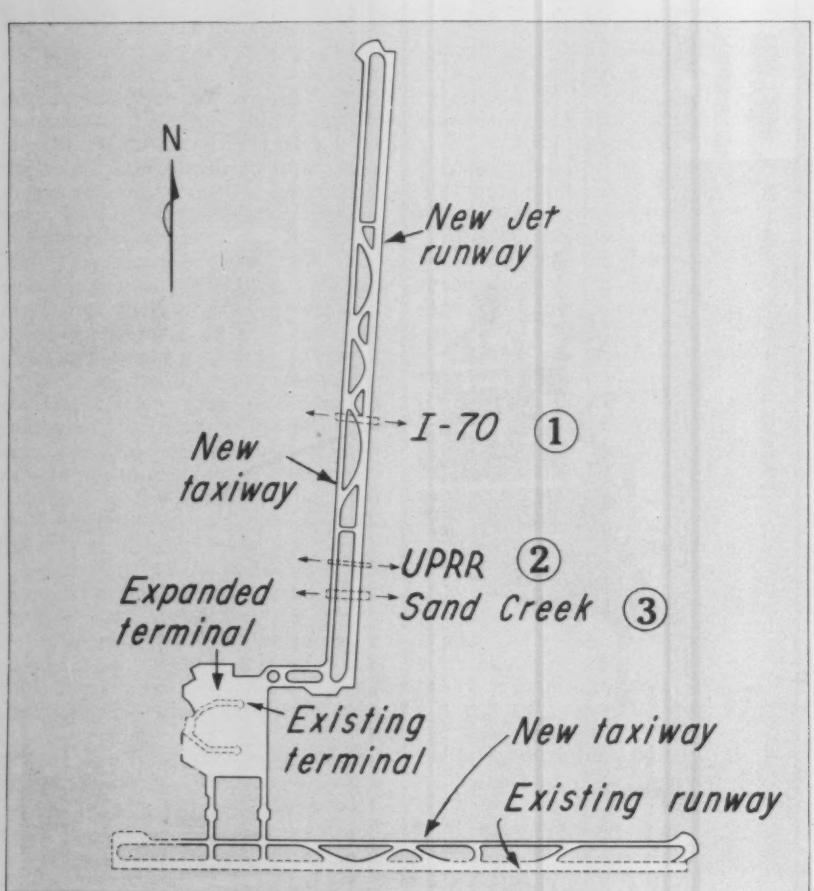


Motor grader pushloads a scraper alongside new taxiway at Denver's Stapleton Airfield.

Jets Will Roll Over Three Major

A new two-mile long jet runway at Denver's Stapleton Airfield crosses a creek, a railroad and an Interstate highway. Major structures will carry the 150-ft wide runway and a parallel 75-ft wide taxiway over these obstacles. A large, four-barrel arch culvert will carry the waters of Sand Creek, an erratic stream subject to flash flooding. Prestressed concrete structures will overpass the main line of the Union Pacific Railroad and the four-lane highway.



NEW RUNWAY will cross a highway (1), a railway (2) and flash-flood creek (3).

Denver's aviation activity has mushroomed since World War II, paralleling the growth of one of the country's fastest growing metropolitan areas. During 1960, Stapleton was the second busiest airport in the U. S. in general aviation civil itinerant aircraft operations; fifth in total aircraft operations; and twentieth in airline aircraft operations.

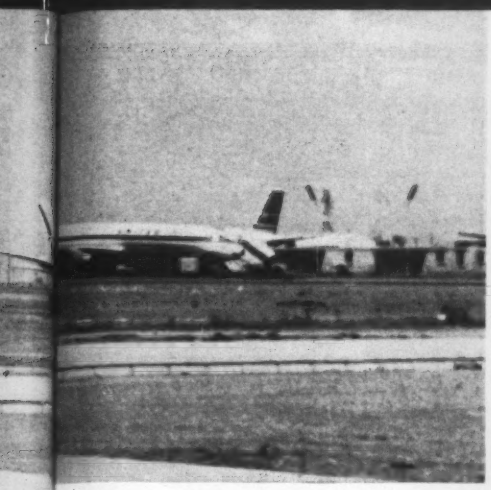
A $20-million improvement program financed by revenue bonds was authorized in May, 1959. Major phases include work on the existing east-west runway and its new taxiways; the new north-south, 11,500-ft jet runway; expansion of the passenger and air freight terminals; a new control tower; new parking aprons; and improvements in the general aviation area.

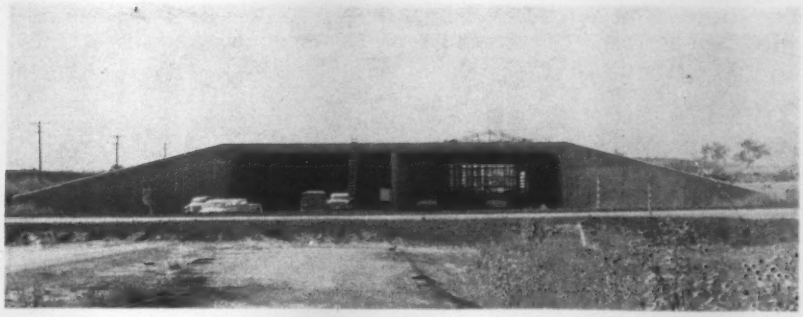
Work on the existing east-west runway-taxiway system is essentially complete. Also finished is a $200,000 street connection to planned Interstate 70 to the north of the terminal area.

Target date for placing the new north-south runway in operation is set for October, 1962.

• **North-south runway**—The new north-south runway begins just north and about 1,500 ft east of the passenger terminal building. Development and land use in the surrounding area influenced both its direction and position. To the west lies Denver; to the south, Lowry Air Force Base and suburban Aurora; to the southeast, Buckley Field, home base for the Colorado Air National Guard. To the north is the sprawling Rocky Mountain Arsenal, a comparative wasteland. It is over this area that take offs will be made from the new runway.

Designers chose a 12-in.-thick reinforced concrete pavement for the taxiway and its connections to the runway.





1—PRESTRESSED inverted "L" frames will span four-lane highway.

2—PRESTRESSED rigid frame will span main line of railroad.

3—FOUR-BARREL ARCH will carry runway over flood waters of Sand Creek.

Structures

aircraft holding areas at either end of the runway, and the critical sections of the runway. Non-critical runway sections totaling about 5,000 ft in length will have a 10-in. thick reinforced concrete pavement.

For blast protection, designers call for a 25-ft wide shoulder on each side of the taxiways. Each shoulder will comprise 2 in. of hot-mix bituminous surfacing on 6-in. of crushed aggregate base course.

There will be four high-speed exit taxiways from the runway, two in each direction. High intensity lights will be provided on both sides of the runway. Engineers have proposed the installation of flush centerline lights on the runway, but the Federal Aviation Agency hasn't yet approved these.

Beginning at the south threshold, the runway and taxiway are on fill; required depth to overpass Sand Creek and the railroad is more than 30 ft. Fill adjacent to the highway overpass (nearly 5,000 ft from the south threshold) is about 15 ft. Beyond this point, there are cuts as deep as 30 ft.

Northwestern Engineering Co. of Denver has moved more than 4 million cu yd of earth under a $2.4-million contract for site preparation, grading, minor structures and incidentals. An estimated $2.5-million paving contract remains to be let, as does a $250,000 contract for runway and taxiway lighting.

• **Sand Creek structure**—Boduroff and Mcheen, Denver consulting engineers, designed the structures that carry the runway and taxiway over Sand Creek, the railroad and I-70. San Jacinto Equipment Co., Bellaire, Texas is building them under a $2.4-million contract.

Sand Creek is an erratic stream characteristic of the semi-arid west. Nearly dry much of the year, it can become a raging torrent on occasion. The new culvert will be able to accommodate a maximum flow of 30,000 cfs.

The Sand Creek structure is a four-barrel reinforced concrete arch that is 764 ft long between headwalls. Each arch barrel is 40 ft wide at the bottom, 17 ft high to the springline. Height of the arch above the springline is 10 ft.

Designers provided buttressed exterior walls for the culvert. The buttresses rest on a line of battered 36-in.-dia caissons spaced 12 ft c-c and driven into an underlying layer of blue shale; a parallel line of 24-in. caissons carries the wall. Each interior wall rests on a sin-

(Please turn the page)

SCRAPERS and other machines will move 4 million cu yd of earth.

gle line of 42-in.-dia caissons spaced 12 ft c-c and driven into the blue shale. Caissons vary from 25 to 38 ft in depth.

Each interior arch wall has triangular openings about 8 ft wide at the base and extending upward to the springline. Designers called for two vertical expansion joints in each wall; one is 43 ft from the outer end, the other 49 ft from the opposite end. There were 14 intermediate construction bays, each 48 ft long. Sections of the vertical joints overlap about 6 in. midway up the arch walls. The entire structure has a 6-in.-thick floor slab.

Backfill over the structure varies in depth, is about 13 ft at the runway centerline. Weep holes extending through the arch roofs near the interior walls provide drainage; the contractor placed clean sand and gravel to a depth of several ft above the walls.

• **Railroad overpass**—Boduroff and Meheen designed the 750-ft long railroad overpass as a two-hinged inverted **U** frame, continuously prestressed (see drawing).

Design load for the structure (and for the other two) was the loading of a DC-8, largest commercial aircraft in current use, plus 15% future overload and 30% impact. Result was one gear load of 212,000 lb, or a total aircraft load of 462,000 lb. Soil pressure against vertical projections was taken as a liquid pressure of 50 lb per cu ft.

Designers realized savings by the use of voids in the solid slab. The voids reduced the dead load without appreciably reducing the section modulus; because of the reduction in area, the prestressing force was reduced.

The original design included vertical voids in the tunnel walls. However, the contractor cast the walls well ahead of the deck, choosing not to use the voids in the walls and applying a larger prestressing force.

The contractor cast the deck slab of the railroad overpass (and the highway overpass) in a 50-ft section of forms supported by adjustable steel scaffolds riding on skids. After curing and prestressing the deck section, workmen lowered the forms a few inches and skidded them to the next position.

The railroad company will install special safety fences extending 1,000 ft each way from the overpass. The fence will be interlocked electrically with block signals to stop all rail traffic if a plane should stray from the runway and end up in the RR right-of-way.

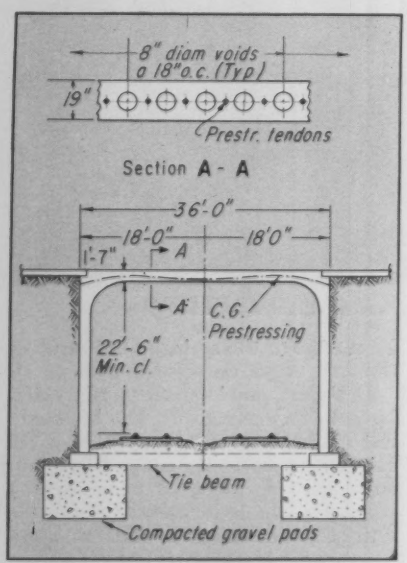
• **Highway overpass**—The 750-ft long highway overpass comprises two inverted, prestressed L frames resting on a common central pier.

Before deciding on prestressed concrete, Boduroff and Meheen made cost studies for three alternate types of structures; steel stringers with composite deck, reinforced concrete frames and the prestressed design. Estimated costs of the three designs were: steel, $1 million, reinforced concrete, $871,000; and prestressed concrete, $776,000.

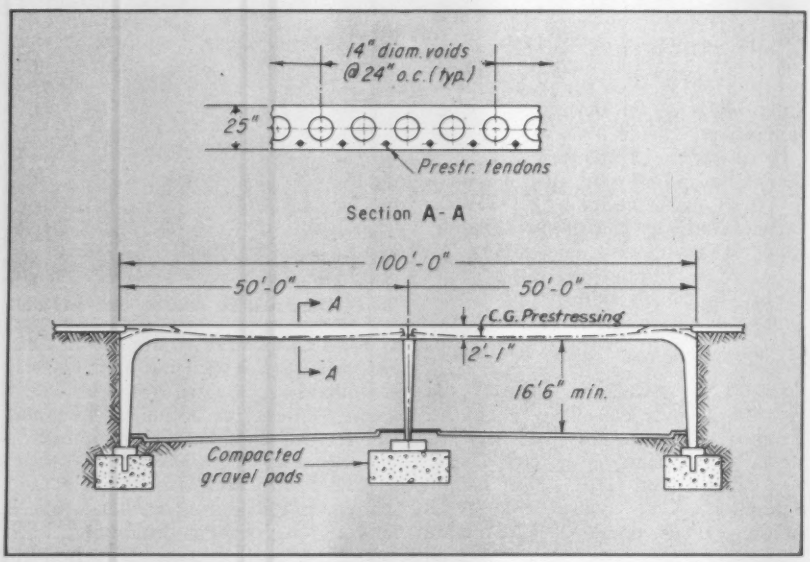
Total height of the structure was also less in prestressed concrete. Since the structure has filled approaches, a reduction in height meant a corresponding saving in earthwork.

Improvements at Stapleton have been under study since 1951. James C. Buckley & Associates of New York City are consultants to the City of Denver on layout and design of the airport, and on financing of the improvement program. Work is being done under a master plan dated March 1, 1960.

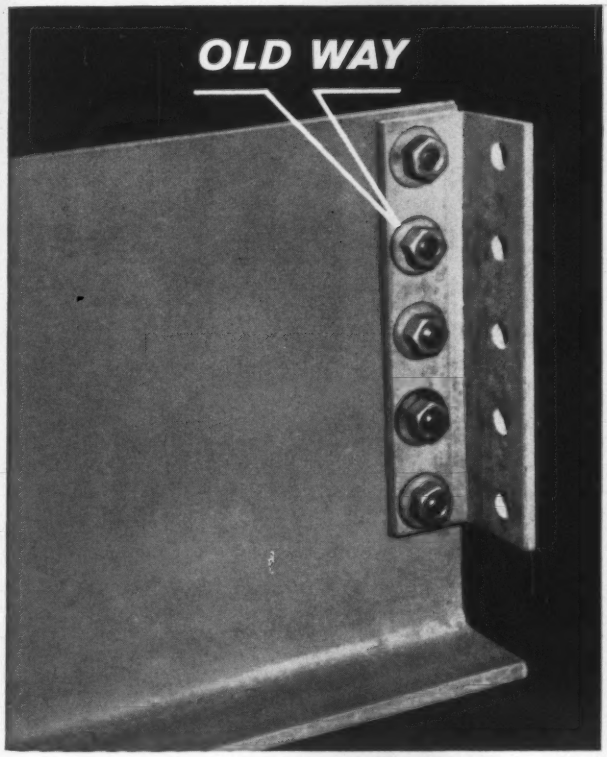
Richard L. Martin is director of aviation for the City and County of Denver, with over-all responsibility for Stapleton Airfield. Ed Thurmond is assistant director. John S. Marshall is supervising design engineer for the Department of Public Works; S. B. Ward is city engineer.

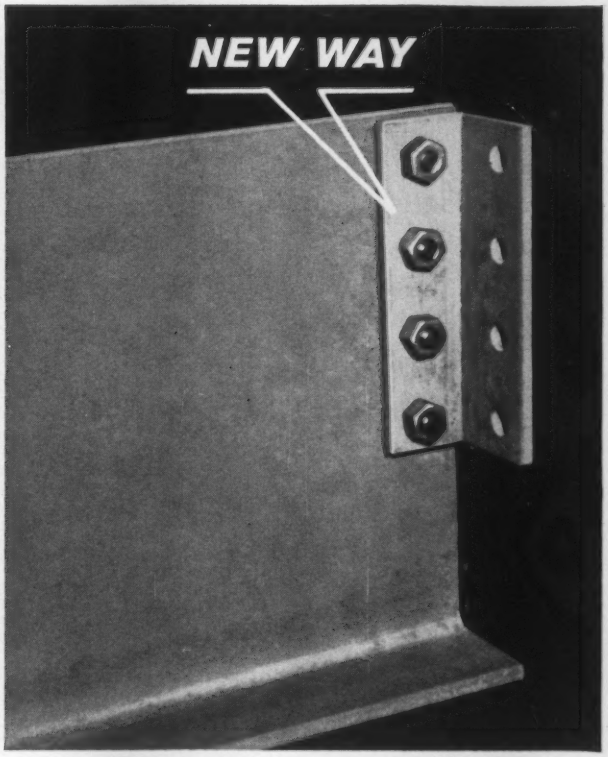


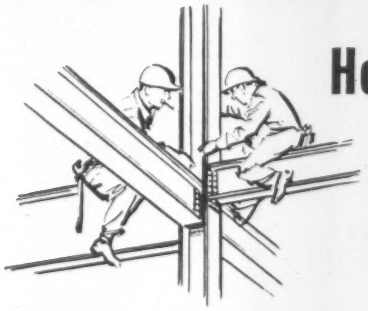
RAILROAD overpass is prestressed.



HIGHWAY overpass has two prestressed frames; voids in deck reduce dead load.







How R B&W A325 bolts can cut connecting costs 15% on one beam alone

Merely changing the way end clips are bolted to both ends of beam pictured not only can cut connecting costs in the fabricator's shop but also in field erection.

This saving is based on an original cooperative study by RB&W and a large midwestern steel fabricator. As now permitted by the new specification, four new heavy-head, short-thread A325 structural bolts replace five regular high-strength bolts in each end. The result: 12 out of 20 washers and 2 out of 10 bolts disappear from two joints. Operating and material cost drops 15%. Shop productivity increases.

Actually, material savings to 40% are possible with the new bolt in bearing-type connections. That's because you can use two RB&W heavy-head A325 bolts and two washers instead of three regular high-strength bolts and six washers when there are no threads in the shear planes of the connection.

Cost reductions start with the structural engineer who designs joints. When he applies this approved 2:3 substitution, shop fabricators and field erectors benefit, and can come through with lower bids.

So familiarize yourself with technical-economic advantages of this better connecting method and a digest of the latest Research Council specifications. Write for Bulletin HHS-1. "How To Use and Specify the New High Strength Bolts." Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, N.Y.

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Amidst snow capped peaks, above an Alpine valley, the Swiss complete . . .

Albigna: Another Open-Joint Gravity Dam

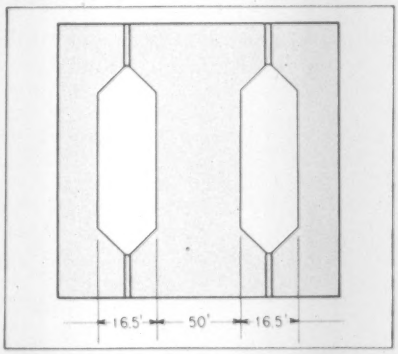
This summer the last of the contractor's plant used to build Albigna Dam was moved away from the site, and Switzerland's newest open-joint gravity section dam was in full service following the first filling of the reservoir last fall.

Located in the southeast part of the country not far from St. Moritz, Albigna is the third and largest of this type of dam to be built. The first was Ratherichsboden in 1950, the second Oberaar in 1953. Both are in central Switzerland near Grimsel Pass. And now a fourth open-joint dam, Sanetsch, is under construction in the southwest part of the country north of Sion.

Albigna Dam is 380 ft high, 2,500 ft long, and required 1¼ million cu yd of concrete. It was built in blocks 50 ft wide, which are separated by 16.5 ft wide joints, as shown in the accompanying drawing.

On the two earlier dams the joints were made only 10 ft wide, so Albigna offers an even greater saving in concrete than its predecessors. This was particularly important since Albigna, located at an elevation of 7,000 ft, had to receive all of its materials by aerial tramways.

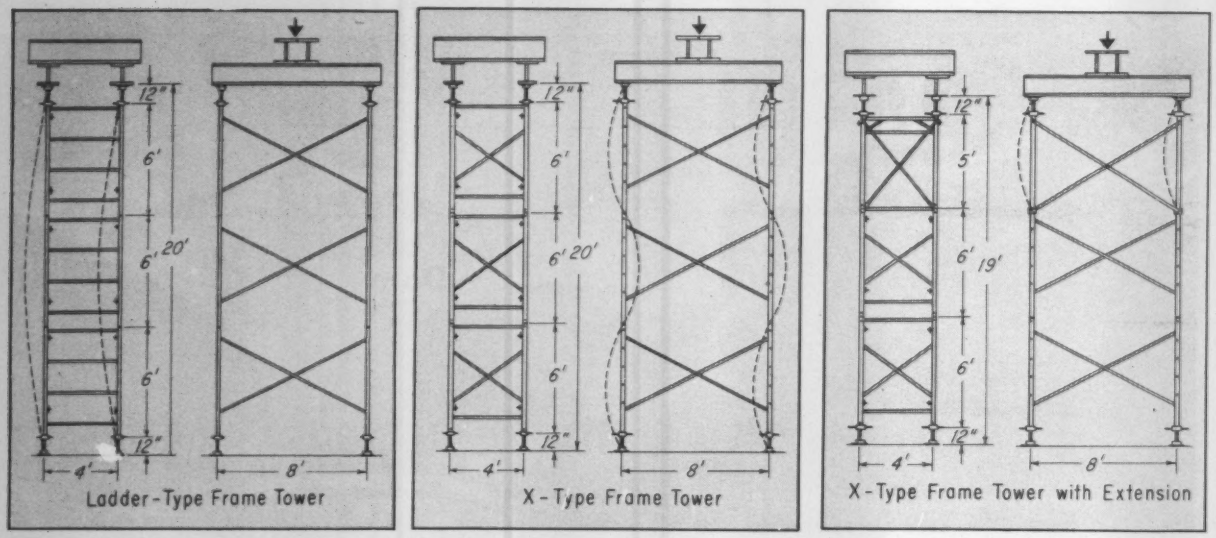
This saving of concrete, about 15% less than with a solid gravity dam, is only one of the advantages claimed for the open-joint design. Others are that the open joints reduce uplift, cut down on the amount of cooling equipment required during construction, help to maintain a uniform temperature in the interior of the dam throughout its life, permit easy inspection of the foundations and the drainage system and provide chambers from which supplemental foundation grouting can be carried out.



OPEN JOINTS in Albigna Dam.

It is also claimed that the savings in concrete, by virtue of the open joints, permits gravity section dams to be considered for sites where otherwise arch or arch gravity sections might be dictated on the basis of economy. And in this same connection, it is pointed out that a leaner, and therefore, more economical, concrete can be used for gravity dams than for the arch or arch-gravity types.

The basic purpose of Albigna Dam's 50,000 acre-ft reservoir is to generate hydro-electric power, but it is unique in Switzerland in that part of the capacity is specifically reserved for flood storage. A disastrous flood, which roared down into the valley from the snow-laden catchment area in 1927, caused a 65 ft dam to be constructed to form a flood detention reservoir somewhat higher up than the present dam site. The new Albigna reservoir had to be made large enough to encompass the volume of this flood control facility.



LOAD TESTS show that column action determines capacity of three common types of scaffolds.

Tests Show How Shores Behave

Cross-braced, tubular-steel scaffold frames, three tiers high, carried 50% more load than ladder-type frames in a series of tests run by Superior Scaffold Co., Culver City, Calif., which makes the X-braced type, and Guy F. Atkinson Co., San Francisco contractor.

Tests on 20-ft shoring towers showed that verticals of ladder-type frames, stacked three tiers high acted as continuous columns that buckled at a load smaller than that carried by one-tier-high posts. But in the X-type frame tower, verticals in each tier functioned as pin-connected short columns, and the tower capacity was not reduced by adding additional tiers.

• **Ladder-type frames**—Under test, a 20-ft ladder tower acted as a 20-ft column. Failure occurred before the design load, based on the height of one tier, was attained. Thus, shorter towers will carry more load, taller towers less. A 12-in.-long extension sleeve connecting two frames lowered the ultimate capacity of the tower.

• **X-type frames**—Loading tests verified the pin-connected action between tiers of X-type frames. Failure load for three tiers was very close to failure load for a single tier. Extension sleeves between frames did not affect the results.

Extendable X-type frames, for variable height adjustment, were also tested. The simplest system consisted of a top frame, with small diameter legs, sliding inside the posts below. Pins, slotted through the lower tubular legs, adjusted the height of the frame. The towers failed at the frames with the smaller diameter legs, at close to the failure load for that tier alone.

• **Frame racking tests**—To evaluate the effect of mishandling, or uneven settlement, one leg was fixed and load applied to the free leg. Ladder frames took a $\frac{5}{16}$-in. permanent set after deflecting 2 in. X-type frames withstood three times more load and set $\frac{1}{8}$-in. after only a $\frac{3}{4}$-in. deflection.

In ladder-type towers, cross bracing, in the plane of the frames, should be used in every third tier, the investigators say. This restricts the buckling action to the tested tower height. Individual ladder-type frames can be improved 30% by welding cross braces in the plane of the frame in every tier. Extension sleeves are not recommended because they reduce the safe allowable working load.

X-type frames only require bracing to stabilize the shoring unit. The capacity of an extendable X-type frame may be based on the strength of the frame with the smallest section, the investigators conclude.

Gas-fed Cell May Power Homes

The natural gas industry is developing a gas-fed fuel cell that may generate all the electricity needed for the average home and, at the same time, reject enough thermal power to handle space and water heating, and air conditioning.

The principle of the fuel cell dates back to early 19th Century experiments with the primary cell. Like the primary cell, the fuel cell directly converts chemical energy into electric energy. Unlike the primary cell, a continuously fed fuel (such as gas) is used instead of stored fuel (such as zinc).

Martin A. Elliot, academic vice president of Illinois Institute of Technology, reported at the annual meeting of the Independent Natural Gas Association of America that IIT has been testing a fuel cell with a molten carbonate for its electrolyte. The cell takes natural gas and steam at the anode and carbon dioxide at the cathode. Rejected heat, from fuel combustion, has ranged from 1,400 to 1,550 F.

Based on test results, Mr. Elliot said, an optimized 1-kw unit could fit into a cube 14 in. on a side; and an 0.8-kw cell used in conjunction with storage batteries could supply all the electrical and heating needs of a home. The combined electrical and thermal efficiency of such a unit may run as high as 80%.

Mr. Elliot also said that IIT is studying solid electrolytes for the gas-fed fuel cell.

ANNOUNCING GMC TRUCKS FOR '62... WITH BUILT-IN BONUSES!

GMC
GENERAL MOTORS CORPORATION
TRUCKS
FROM ½ TO 60 TONS

PULL HERE

TEAR OUT AND SAVE

NEW IN MANY LIGHT AND MEDIUM-DUTY MODELS—

NEW HIGHEST PERFORMANCE! NEW OUTSTANDING ECONOMY! NEW DEPENDABILIT

Now, GMC brings you—as standard equipment—the great performance of the exclusive, fuel-saving 165 hp. engine! You get the *most working power* at low rpm of any comparable truck. Get your hauling job done quic easier and save fuel at the same time. And this proved 305D is a *truck-built* engine with usable power, performance, produced at low, wear-resistant speeds to give you extra-bonus life . . . at no extra cost.

Notice the new, distinctive GMC styling including lower hood with rounded edges for safer vision. New sparkling colors, inside and out. Triple-stitched upholstery increases seat life. Suspended pedals are easy to reach and operate. Instruments are redesigned for better reading, safer driving.

For 1962, you get new or improved profit-making advances in new GMC 105″ Conventionals, from ½-ton pickups to the big 60,000 lbs. GCW six-wheelers.

NEW 105″ CONVENTIONALS

Wideside 4-wheel-drive Custom Pickup—5,600 lbs. GVW

PROVED AND IMPROVED MEDIUM AND HEAVY-DUTY MODELS—

EASY SERVICING . . . EASY DRIVING . . . IDEAL WEIGHT DISTRIBUTION!

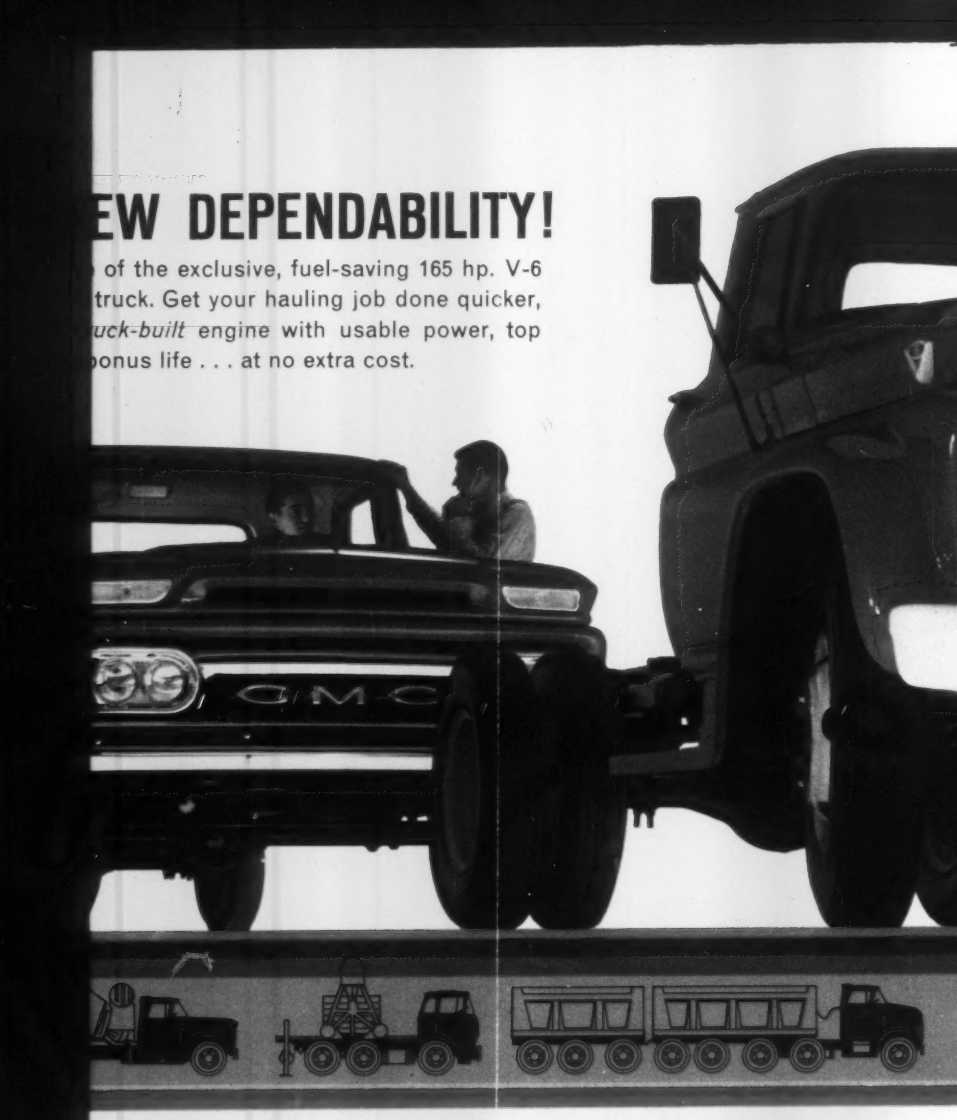
. . . all yours with GMC Steel Tilt-cabs. Full 55 degree tilt completely uncovers the engine and all accessories, but controls remain in perfect alignment on rigid stationary island. You get short turns and easy handling. Bonus loads are yours, too, with front axle set-back 52″ for maximum rated capacity, short 72″ BBC and wheelbases as short as 98″.

72″ TILT CABS

SUPER

EW DEPENDABILITY!

of the exclusive, fuel-saving 165 hp. V-6
truck. Get your hauling job done quicker,
uck-built engine with usable power, top
onus life . . . at no extra cost.



DELS—

G . . .

SUPERIOR PERFORMANCE

GMC Model 3505
18,000 lbs. GVW

Here are just a few applications of GMC Construction Trucks for 1982.

CE!

This 90″ BW7012 has the most powerful standard gas engine in any construction truck . . . the exclusive 275 hp. Twin-Six. Another example of how GMCs save time and expense. You can also get the only bonus-life, fuel-saving V-6 gas engines in the industry. Also V-6 diesels with high earning power and great saving power. Available in models from 19,500 lbs. GVW to 120,000 lbs. GCW.

90″ CONVENTIONALS

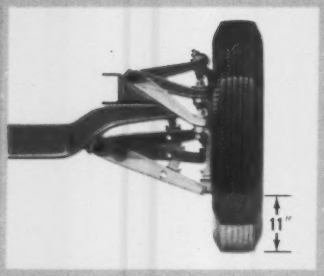
LOW-COST SIX-WHEELERS WITH BUILT-IN STAMINA THROUGHOUT!

This new GMC W5008 six-wheeler saves you money when you buy and as you own. Here's why: (1) Buying price is surprisingly low, (2) You get the exclusive, bonus-life V-6 engine, 351 cu. in. or optional 401 cu. in. (3) Suspensions are improved for easy riding and continuous high axle loadings, (4) Low ground to cab floor height for easy in and out, (5) Plus many more built-in durability and dollar-saving bonuses.

105″ CONVENTIONALS

BUILT-IN BONUSES MAKE 196

Improved suspension. New, low deflection rate springs and shock absorbers are standard on wide-tread, I-beam front axles. You get good cushioning, great stability and short turning. Also available: higher-capacity front axles with these easy-ride springs, or with high-capacity springs.

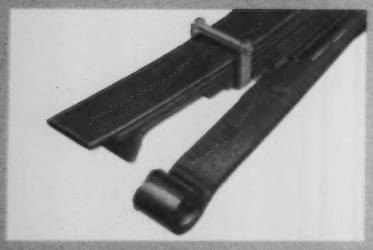


Smooth out bumps up to 11" high with GMC's independent front suspension. Wheel fight is eliminated. Handling is easier and safer. Riding is smoother, nearly like a passenger car. One ride will give you all the convincing proof.

New and improved transmissions are offered this year . . . built stronger with higher torque capacities for lasting service. A new short-fourth is ideal for split shifting to save time and speed schedules. Plus—all the job-proved types with strength and ratios to give top performance on any construction haul.

Strong, twist and flex-resistant GMC frames are made to take the big axle loadings, shock loads and rough terrain of all construction hauls. Advanced design and traditional types — including the short "K", upright "L" type reinforcements and weight-saving, heat-treated side rails.

Service-free tandem shown here has "walking beam" design with rubber mounts and bushings at all wear points. Loads are always divided 50-50 on each axle and axles are always in proper alignment for increased tire and axle life.



Long-life, easy-ride vari-rate rear springs are standard on four-wheel models. Springs only support the load. Braking and torque reactions are transmitted to the frame by the built-in torque leaf. Springs are free at both ends, ride on cams that automatically adjust the springs to the loads.

SEE YOUR GMC TRUCK DEALER LISTED IN THE YELLOW PAGES FOR ALL THE PROFIT-FACTS.

GMC TRUCK & COACH — A GENERAL MOTORS DIVISION — PONTIAC, MICH.

062 GMC CONSTRUCTION TRU

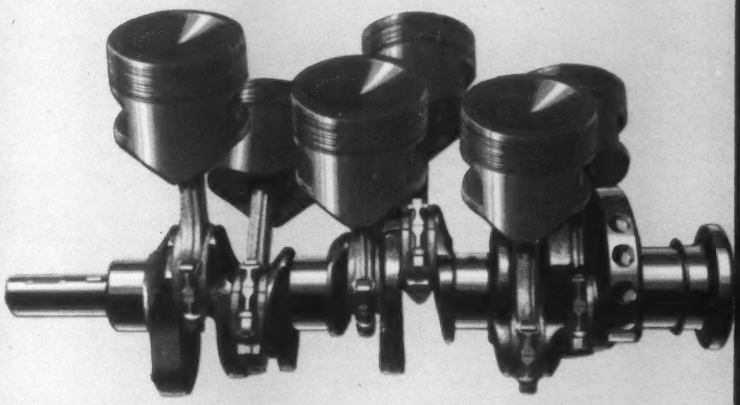
V-6 EXCLUSIVE, COST-BUSTING ENGINES... BUILT TO OUTLAST, OUTPERFORM ALL OTHERS!

These are truck-built engines for trucks only, with no compromises, to give you unsurpassed durability. Every part is built extra-rugged, rigidly inspected and tested during the entire build-up. You get top performance, too. GMC V-6 usable working power is produced over a broad range at low operating speeds. Power-robbing friction and damaging wear are reduced. Fuel and maintenance costs are at a minimum.

ENGINE MODEL	MAX. TORQUE RANGE	MAX. HORSE-POWER	TRUCK SERIES
305D	275-280 @ 1100-2400	165 @ 3800	1000, 1500, 2500 3000, 3500
305C	275-280 @ 1100-2400	165 @ 3800	4000, B & L4000
351	308-312 @ 1400-2400	180 @ 3400	5000, W5000 B & L5000 BW5000 4000* B & L4000*
401	375-377 @ 1200-2000	210 @ 3400	H5000, W5500, B & L5500 BW & LW5500 W & BW5000*

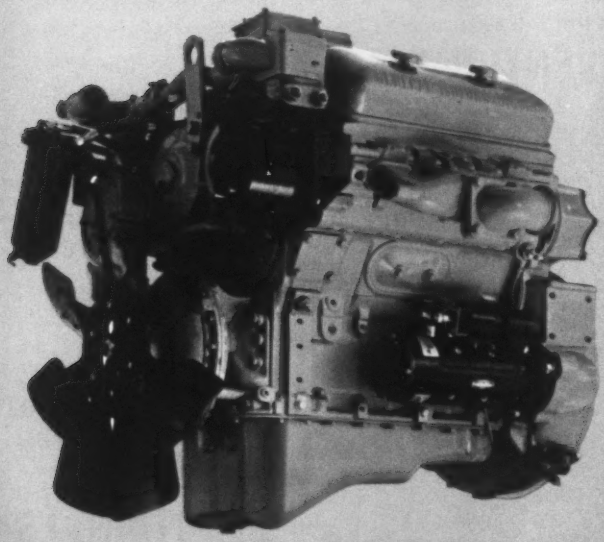
*Optional

● Piston travel is up to 26% less than comparable engines. Saves thousands of engine rpms every mile to reduce gas bills and service costs. GMC-built aluminum pistons have cast-in steel expansion band, chrome-faced top ring, big 1.24" diameter piston pin that's case-hardened and everything for lasting operation and proper oil control.



● Every GMC connecting rod is checked and inspected 9 ways to guarantee exacting dimensions and weight . . . to assure you extra bonus life.

● V-6 crankshafts are twice as husky as comparable V-8s . . . tougher, stronger to last longer. Bearing areas are up to 60% greater than comparable engines for thousands of extra trouble-free miles.



MORE POWER PER DOLLAR PER POUND PER CUBIC INCH

GMC Truck diesel engines are lower cost, up to 530 pounds lighter and several inches shorter than comparable diesels. You get faster acceleration, smoother power and increased fuel economy with GMC's two-cycle design that produces power on <u>every</u> downstroke, double that of four-cycle engines. And there are many, many more built-in bonuses your GMC Diesel Truck Dealer will gladly explain.

Max. Torque—604 @ 1200 Max. Hp.—218 @ 2100

At sea level and 60°F

CKS A SOUND INVESTMENT!

Valves are made to last with short, stiff stems—sodium-filled on 351 and 401 exhaust valves—for better heat dissipation and added life. Big diameter valves permit freer breathing for top efficiency. Integral valve guides reduce stem exposure to hot gases and assure faster heat transfer.

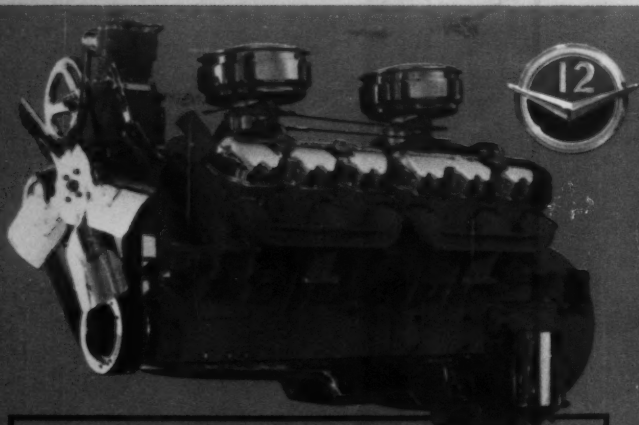
Most effective method of prolonging valve life is GMC rotators. Positive, self-cleaning action prevents premature failures. Optional on 305D, standard on all others.

Concentrated, damaging "hot spots" are eliminated with up to 167 gallons of coolant circulating every minute and with up to 33% more cooling surface than other engines. Coolant temperature varies less than 4 degrees throughout the entire engine. More proof that GMC engines are built to last longer.

Exhaust valve seat inserts, standard in 351 and 401 engines, are made of hard nickel-chromium-tungsten-cobalt alloy steel to withstand the intense heat and wear.

COOLER RUNNING... NEEDS LESS CARE

TEAR OUT AND SAVE



ENGINE MODEL	MAX. TORQUE RANGE	MAX. HORSE-POWER	TRUCK SERIES
702	625-630 @ 1400-2100	275 @ 2400	B & L7000 BW & LW7000

MOST LOAD-MOVING POWER YOU CAN GET! EXCLUSIVE, BONUS-LIFE TWIN-SIX

This is the only standard gas engine that gives you 275 hp. performance . . . the power needed to get the big loads rolling without laboring the engine or driveline . . . the power to keep rolling with up to 60% less shifting than trucks with other gas engines. And this is low-stress, easy-stroking power, as you can see on the chart. Results: amazing fuel economy and greatly increased engine life.

Acoustical Ceiling Vents Air

Thousands of tiny perforations diffuse air through ventilating acoustical ceiling tiles designed for air distribution, sound absorption and decoration. This type of ceiling reduces construction costs for ductwork and diffusers, says the producer, Armstrong Cork Co.

In some cases, only stub ducts are needed in order to distribute air streams to ceiling plenums. As air builds up a low pressure in the plenum, air is gently forced into a room through the perforations.

Because the entire ceiling distributes air, there are no drafts or stagnant spots in a room. The continuous movement of air tends to repel dust and dirt from the ceiling. Any conventional return system can be used with the ventilating tiles.

Tiles are available with five sound-absorbing finishes—all incombustible. Two of these five are rated as fire protection for floor or roof by the Underwriters' Laboratories. Armstrong Cork Co., 4200 Miller St., Lancaster, Pa.

Soil Testing Devices Are Portable

The Testlab Corp., maker of equipment for testing soils, has two new instruments available. One of these devices is designed for measuring soil density and the other is for use in conjunction with the firm's nuclear moisture/density gage.

The first of these, called the Volutester, measures the density of soil in the field using the balloon-density method. Two models are available. One version is rigged so that an operator can kneel to hold the unit down while testing. It is equipped with a plastic graduated cylinder, a hand pump and a pressure equalizing relief valve. The other version, without these features, is lower priced.

The other instrument is a portable electronic scaler for detecting radioactive isotopes. This unit weighs 15 lb and is battery operated. The scaler is the basic instrument used in recording the neutron and gamma ray count detected with the firm's nuclear moisture and density meter system. Testlab Corp., 3398 N. Milwaukee Ave., Chicago 41, Ill.

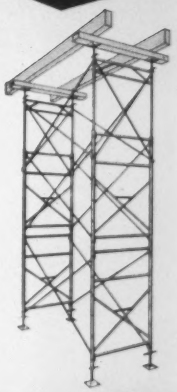
Diesel Engine Power Raised Without Adding Weight

A "PowerRam" modification of the naturally-aspirated Thermodyne diesel engine, adds 10 hp to the engine with no increase in weight.

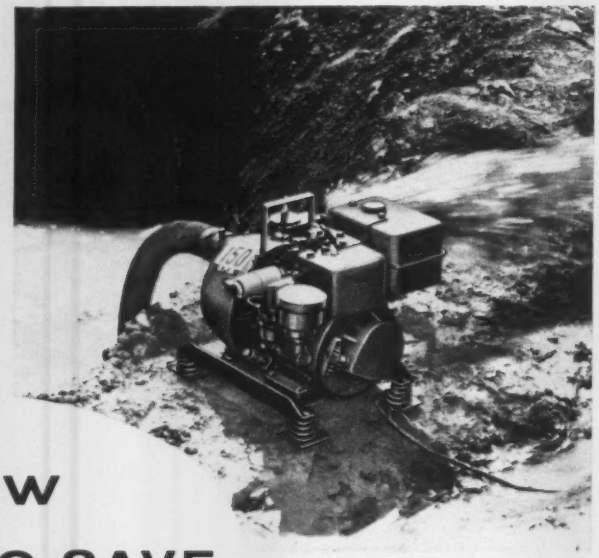
A 10% increase of volumetric efficiency by a new air intake principle makes the additional power possible, says the manufacturer. Mack Trucks, Inc., Plainfield, N.J.

(Please turn the page)

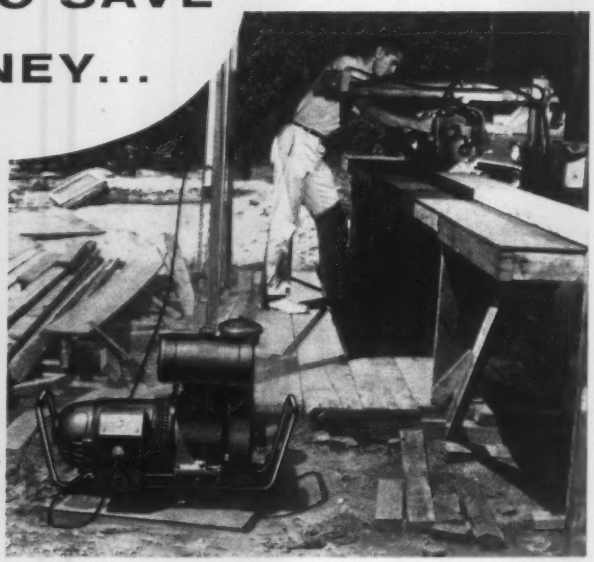
SHORE
Pat Pend
the only
HEAVY DUTY
fully braced
"X" tendible
SHORE



SHORE
Pat Pend
COSTS { 10% to 20% less to buy
5% to 10% less to erect
GIVES { Easy adjustment to any height
10% to 40% more load
Now in use on 8 major bridge and heavy construction projects.
For details call UPton 0-2985
or write
SUPERIOR scaffold co.
5624 BANKFIELD AVE., CULVER CITY, CALIF.
TO: SUPERIOR SCAFFOLD CO.
5624 Bankfield Ave., Culver City, California
_____ Please send data on SHORE "X" Scaffold.
_____ Also include data on Tubular Steel Scaffold.
Name _____ Title _____
Company _____
Address _____
City _____ Zone _____ State _____



NEW WAYS TO SAVE MONEY...



Homelite Pumps and Generators with **4-Cycle** Engines

A brand new line of economy-priced, 4-cycle engine-driven pumps and generators has just been added to Homelite's roster of construction equipment. Now, from one sales and service source, you can get the exact carryable pumps and generators your jobs require . . . low-cost, 4-cycle engine powered equipment . . . or finest-quality carryable pumps and generators powered by Homelite 2-cycle engines.

Homelite's new, self-priming pumps are available in 1½", 2", and 3" centrifugal and 3" diaphragm models. They feature new, extra-long-life CERASEAL ceramic seals, Briggs & Stratton engines with special, long-life valves and variable speed control; 28' suction lift and big pumping capacities. Homelite's new generators come in 1500, 3000 and 5000 watts sizes with quality features such as TOOLSAVER voltage regulation; Wisconsin & Clinton engines with long-life Stellite exhaust valves; and simple, trouble-free generator construction.

All Homelite 4-cycle pumps and generators are available with either gasoline or L. P. gas operated engines.

Ask for a demonstration of these new, compact, lightweight and easily carried units now.

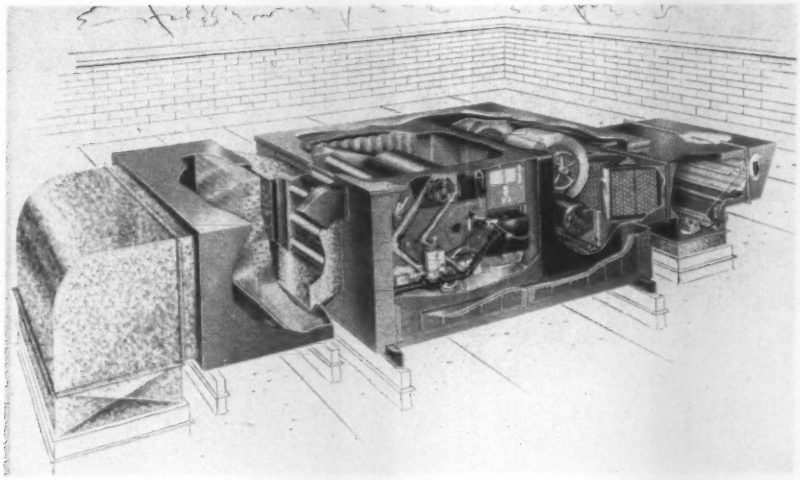
Homelite factory branches are located throughout the country. Your nearest one is as near as your phone. Call them or write for convincing demonstration or rapid service in any way.

HOMELITE

CARRYABLE PUMPS • GENERATORS
BLOWERS • CHAIN SAWS

Franchises available in some areas, write for details.

HOMELITE • A DIVISION OF TEXTRON INC., 1111 RIVERDALE AVE., PORT CHESTER, N.Y.
IN CANADA — Terry Machinery Co., Ltd.



Heating Line Offers Flexibility

An all-weather casing, a lower silhouette and increased flexibility have been incorporated in the 1962 line of Lennox roof-top heaters, condensers and cooling evaporators.

Heating outputs of RT series central heaters range from 280,000 to 1,000,000 Btu per hr, with an air volume range of 3,000 to 15,000 cfm. Designed for commercial and industrial applications with gas or No. 2 oil, the heaters are also available with combination oil and gas-fired burners.

Installations can be made for heating only (without filters), heating and ventilating (with or without filters), or heating-cooling and ventilating. Dampers on ventilating units can be manual or automatic.

Capacities of the 931-series evaporators range from 10 to 45-tons. With the evaporator and blower in separate modules, there is space in the evaporator section for an add-on reheat coil, down stream of the cooling coil. An optional steam or hot-water heating coil may also be installed, at the factory, up stream of the evaporator coil.

The evaporator coil is in two sections, permitting capacity reduction and (in effect) a built-in face and by-pass for humidity control.

Air volumes for the two centrifugal blowers in the evaporator system range from 4,000 to 15,000 cfm. Blower outlets are recessed so that the two blower streams converge inside the blower cabinets; thus, eliminating the need for dual-stream ductwork leading away from the unit.

Stacking for the heater and its vents, the evaporator and blower units can be horizontal or vertical.

The air-cooled condensing units, with capacities from 8 to 35 tons, offer a Btu-per-hr range from 110,000 to 360,000, at 95F outdoor temperature.

An optional kit is available with the condenser that will modulate refrigerant flow according to the outside temperature. LENNOX INDUSTRIES INC., MARSHALLTOWN, IOWA.

Rigid Panels Offer Versatility

Nu-Way insulation panels are 2 ft square and offer a compression strength of 16 to 20 psi.

Made of foamed polystyrene, they can serve as moisture barriers for concrete slabs. With overlapping edges, they serve as a continuous-thickness wall insulation that can be finished with paint or wood, plastic and metal laminates. And, weighing less than cork, they can be installed as ceiling insulation.

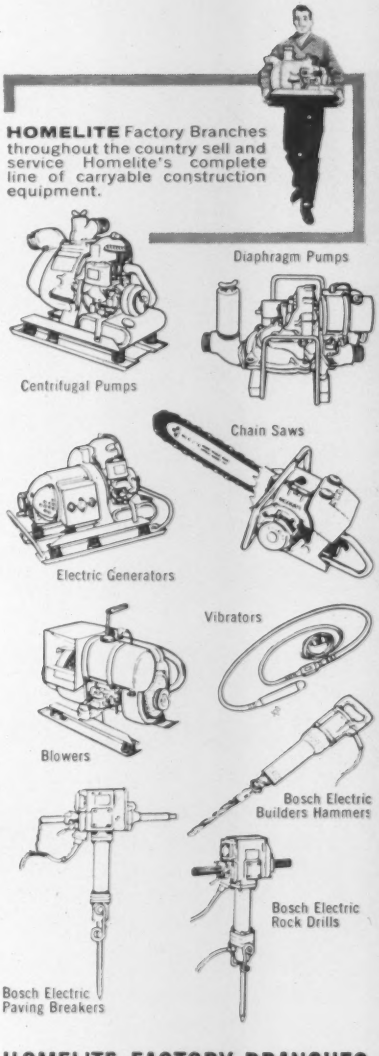
Standard tools can cut, saw and mill the decorative panels. Although the manufacturer's adhesive is recommended for bonding to masonry, no special techniques are needed to staple, nail or glue the panels.

They are available in thicknesses from 1 to 8 in., and in densities from 1 to 15 lb. per cu ft.

Both regular and fire-resistant panels come laminated, upon request, in two different densities.

Other applications include built up roofs, cavity walls and sub-bases for driveways and sidewalks. UNITED PROGRESS INC., 54-60 DOTT AVE., ALBANY 5, N.Y.

(*New Products continued on p. 70*)



HOMELITE FACTORY BRANCHES

EAST: CONNECTICUT: Greenwich, Hartford • NEW JERSEY: North Arlington, Woodbridge • NEW YORK: Albany (Latham), Buffalo, New York (North Arlington, N. J.), Rochester, Syracuse • MAINE: Orono • MARYLAND: Baltimore • MASSACHUSETTS: Boston (Allston) • PENNSYLVANIA: Altoona, Erie, Harrisburg, Hazleton, Philadelphia, Pittsburgh, Malvern • VIRGINIA: Arlington • WEST VIRGINIA: Charleston, Clarksburg

SOUTH: GEORGIA: Atlanta • FLORIDA: Jacksonville, Miami • LOUISIANA: New Orleans (Metairie), Shreveport (Bossier City) • NORTH CAROLINA: Charlotte, Raleigh • OKLAHOMA: Oklahoma City • TENNESSEE: Knoxville, Memphis • TEXAS: Dallas

MID-WEST: ILLINOIS: Chicago (Stone Park) • INDIANA: Indianapolis • MICHIGAN: Detroit, Grand Rapids • MINNESOTA: St. Paul • MISSOURI: Kansas City, St. Louis • NEBRASKA: Omaha • OHIO: Cincinnati, Cleveland, Toledo • WISCONSIN: Milwaukee

WEST: CALIFORNIA: Fresno, Los Angeles (Alhambra), Sacramento, San Francisco • COLORADO: Denver • OREGON: Portland • UTAH: Salt Lake City • WASHINGTON: Seattle, Spokane

HOMELITE
A DIVISION OF TEXTRON INC.
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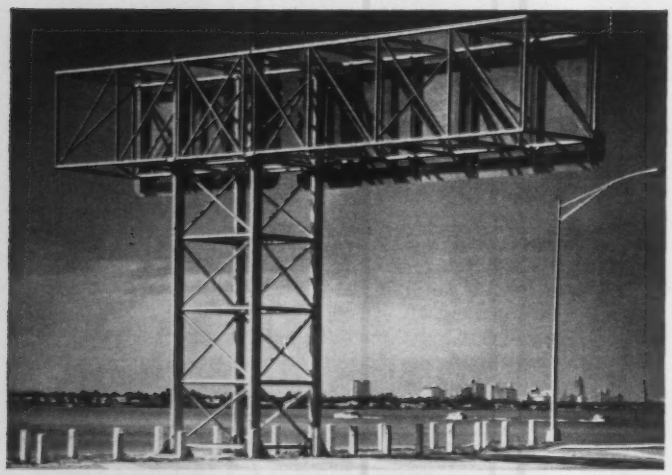
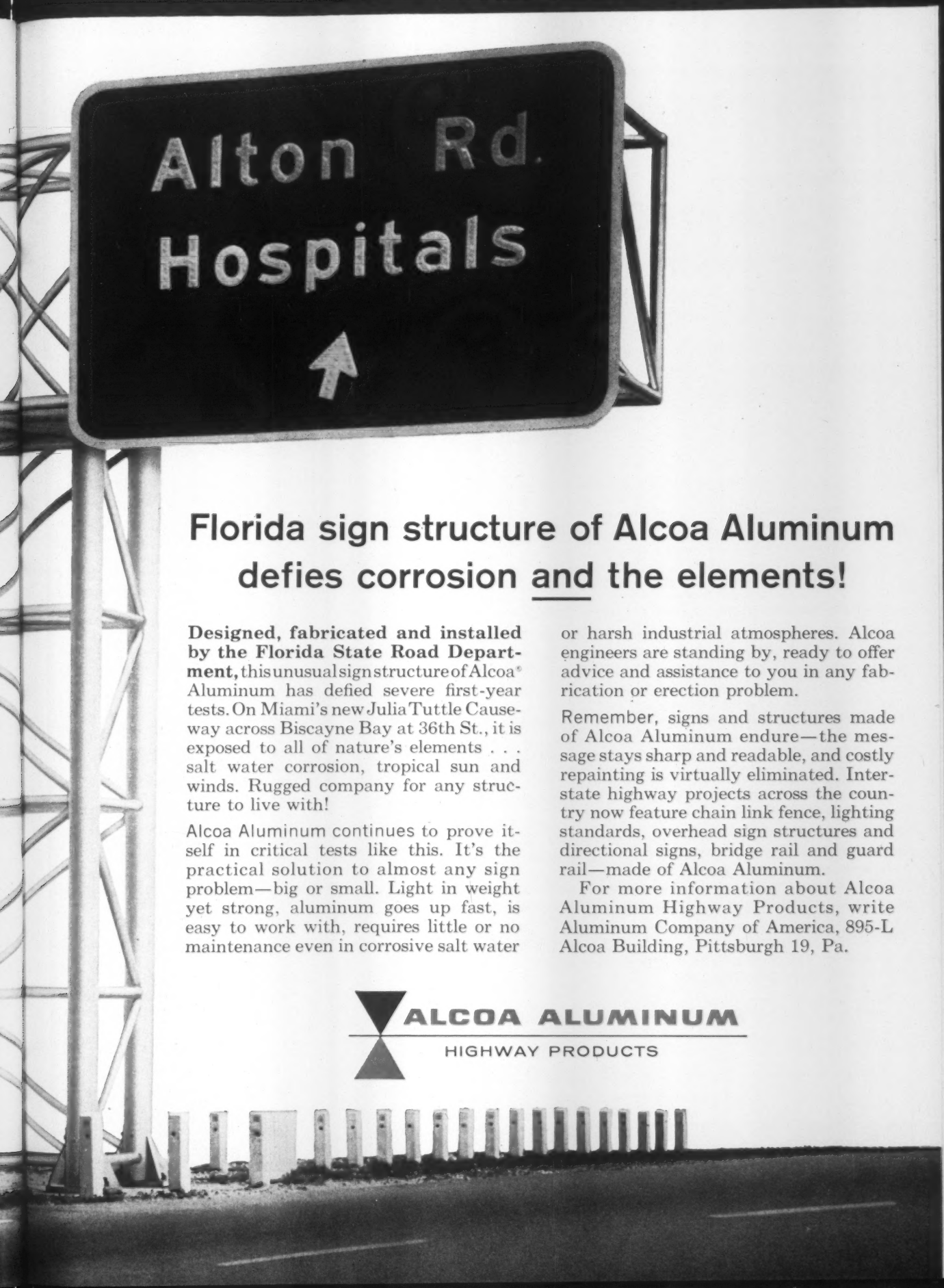


LOOKING TOWARD MIAMI, you see the strong Alcoa Aluminum structure for the Arthur Godfrey and Alton Road signs. First visible a mile away, the sign directs about 25,000 fast-moving vehicles a day.



Florida sign structure of Alcoa Aluminum defies corrosion and the elements!

Designed, fabricated and installed by the Florida State Road Department, this unusual sign structure of Alcoa® Aluminum has defied severe first-year tests. On Miami's new Julia Tuttle Causeway across Biscayne Bay at 36th St., it is exposed to all of nature's elements . . . salt water corrosion, tropical sun and winds. Rugged company for any structure to live with!

Alcoa Aluminum continues to prove itself in critical tests like this. It's the practical solution to almost any sign problem—big or small. Light in weight yet strong, aluminum goes up fast, is easy to work with, requires little or no maintenance even in corrosive salt water or harsh industrial atmospheres. Alcoa engineers are standing by, ready to offer advice and assistance to you in any fabrication or erection problem.

Remember, signs and structures made of Alcoa Aluminum endure—the message stays sharp and readable, and costly repainting is virtually eliminated. Interstate highway projects across the country now feature chain link fence, lighting standards, overhead sign structures and directional signs, bridge rail and guard rail—made of Alcoa Aluminum.

For more information about Alcoa Aluminum Highway Products, write Aluminum Company of America, 895-L Alcoa Building, Pittsburgh 19, Pa.

ALCOA ALUMINUM

HIGHWAY PRODUCTS

OWNERS REPORT

On Ellicott Dragon® Model Portable Dredges

California Irrigation District Manager

O. E. Simmons, Palo Verde Irrigation Dist., Blythe, Cal., says, "All checks indicate the dredge is exceeding the specified capacity. Our operators frequently comment on the simplicity of operation and the small amount of effort required to handle the control system."

Georgia Dredging Company Official

James G. Hardee, III, Chatham Dredging Co., Savannah, Ga., reports, "We are well pleased with the operation of our DRAGON's all-hydraulic system. It is excellent. It has insured very economical ease of operation."

Ohio Municipal Water Department Director

W. T. Eiffert, Dayton, Ohio, writes, "We have never received such a complete piece of equipment, nor have we ever received such complete training in the operation of a new piece of equipment."

Florida Real Estate Developer

Leonard Mulbry, "Venezia," New Smyrna Beach, Fla., states, "We have been more than satisfied with the production and operation of our Ellicott DRAGON. It is well engineered, accurately constructed and economical to operate. We have determined the value of obtaining a completely engineered dredging unit from a reputable manufacturer rather than building one ourselves or obtaining one from a less well-established firm."

Other satisfied users of Ellicott DRAGONS have made similar statements, all of which testify to the DRAGONS' top-flight design, quality Ellicott components and proved performance. When you are considering the purchase of a dredge to excavate underwater earth materials, we will be glad to furnish the technical details on the correct DRAGON for your project.

A comprehensive brochure describing the complete line of standardized DRAGON model dredges and their wide variety of applications has been prepared for you. Simply fill in the handy coupon and your copy of Bulletin 980 will be mailed promptly.

ELLICOTT MACHINE CORPORATION, Baltimore 30, Maryland, U.S.A.; Ellicott-Brandt, Inc., Baltimore, Maryland; McConway & Torley Corp., Pittsburgh, Pennsylvania; Timberland-Ellicott, Limited, Woodstock, Ontario, Canada; Dragues Ellicott France, Paris, France; Dragas Ellicott do Brasil Ltda., Rio de Janeiro, Brazil; Ellicott de Mexico, Mexico City, Mexico.
Successors to the floating dredge business of the Bucyrus-Erie Company and the American Steel Dredge Co. Complete engineering, design and construction service.

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3002

Hydrocrane Is Mounted On Self-Propelled Wagon

The H-5 Wagon Mounted Crane consists of Bucyrus-Erie's 12 ton, ½ yd. Hydrocrane and a self-propelled wagon.

The rig has a wheelbase of 110 in. and a turning radius of 22 ft. It has an overall length of 35 ft with the standard two-piece boom retracted and a 9-ft width with the outriggers retracted. And the wagon has an oversize Clark planetary driving axle, which provides a 22.35 to 1 gear ratio.

The operator's station in the crane cabin contains all controls—accelerate, start and stop, gear selection, steering. The machine has a Ford, six cylinder, gasoline engine featuring Cruise-O-Matic transmission with three forward speeds and one reverse.

The manufacturer says that rear wheel, hydraulic steering provides extra maneuverability. Bucyrus-Erie Co., S. Milwaukee, Wis.

Two Spreaders Feature Hydraulic Cab Control

Two spreaders—a replaceable tail gate type and a V-box type—feature hydraulic cab control.

A movable, cab-controlled chute drops the material onto the spinner in a spreading position. An adjustable metering gate allows the spreading of small amounts of material with precise control.

Shuffling augers operate in opposite directions, and the auger speed is adjusted by means of hydraulic flow control valves.

The spinner, augers and truck speed are independent of each other, according to the manufacturer. Swenson Spreader & Mfg. Co., Lindenwood, Ill.

Curtain Wall Interlocks Without Nuts and Bolts

The Pac/Wall 710 series is an aluminum curtain-wall system that can be installed for an average cost of $2.30 per sq ft, according to the manufacturer.

All components are modular. They lap and interlock without nuts and bolts. Horizontal and vertical components are cut to size at the factory. The only field work required is assembly.

Designed for one and two-story construction, Pac/Wall 710 meets requirements for deflection and watertightness given in the Curtain Wall Manual of the National Association of Architectural Metal Manufacturers.

Design characteristics of the 710 series include an unbroken watertight seal throughout entire wall; lapped connections that permit expansion yet maintain watertightness; and a T-shaped mullion with a thin profile. Pacific Curtainwall, Inc., 600 West 15th St., Long Beach 13, Calif.

Rigid Plastic Increases Insulation of Flat Roof

Barrett urethane-foam roof insulation offers a range of thermal conductance values, C, from 0.19, for a 0.8-in.-thick panel, down to 0.07 for a 2-in.-thick panel. A 1-in.-thick panel is equivalent to 2 in. of glass fiber or polystyrene, the manufacturer says.

The urethane panels are laminated on both sides with a tough roofing membrane. They can be walked on and mopped directly with hot pitch or asphalt. The urethane will not absorb water, according to Barrett, and it is said to be resistant to most chemical solvents.

Designed for flat roofs, the urethane insulation meets the specifications of a Barrett bonded roof. Barrett Division, Allied Chemical Corp., 40 Rector St., New York 6, N.Y.

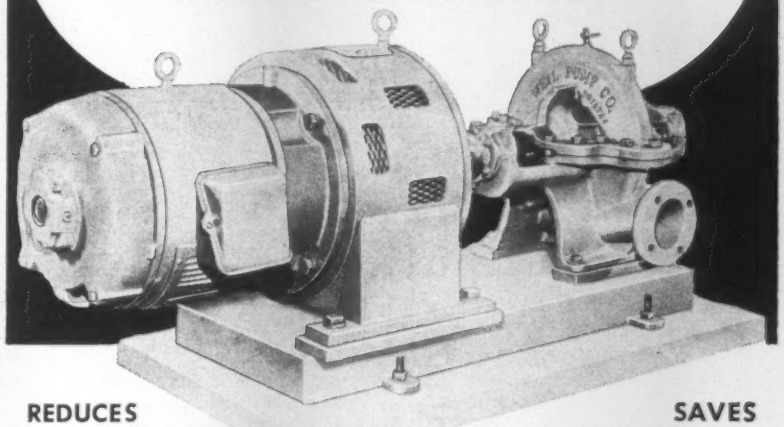
Skin Coating Prevents Dry or Wet Cement Burns

Kerodex No. 71 is a waterproof, greaseless cream that protects skin from irritation caused by the corrosive alkalinity of wet or dry cement and plastering compounds.

Those working where dry powder is suspended in the air can apply the cream to the neck and face.

Kerodex also protects against many other irritating compounds, including acids, caustics and plating solutions, says the manufacturer. Ayerst Laboratories, 685 Third Ave., New York 17, N.Y.

INTRODUCING THE
weil
EVER-FLO
WATER BOOSTER SYSTEM



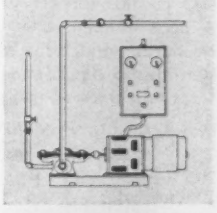
REDUCES MAINTENANCE

SAVES SPACE

Maintains Constant Pressure under extreme variations in demand . . . and/or supply.

Applicable wherever a finely controlled pressure booster system is desired for industrial, commercial or residential use.

The Weil Ever-Flo system accomplishes the desired result by means of a variable speed coupling between the motor (5-100 h.p.) and the pump, which is controlled directly by the system pressure. The coupling accelerates or decelerates the pump speed . . . result—CONSTANT PRESSURE.



Here is a typical Weil Ever-Flo installation.

A COMPLETE PACKAGE SYSTEM

Space Saving

Valuable floor space reduced 80% . . . no tanks, compressors or intricate level controls.

Reduced Maintenance

Absence of unnecessary equipment reduces maintenance. Life expectancy . . . better than standard electric motor.

Ease of Installation

Installation time reduced to that of straight pump and motor.

Economy of Operation

Motor runs constantly . . . reducing stop-start strain . . . eliminates extra power needed for intermediate starting. Uses only horsepower required to do the job.

Write for Bulletin No. EF-250A

weil PUMP COMPANY
1530 NORTH FREMONT STREET CHICAGO 22, ILLINOIS

INSURE DESIGN STRENGTH

of concrete cured below 70°F by adding Columbia Calcium Chloride to your mix —2 pounds for every bag of Portland cement. "Design strength" is determined by curing under lab conditions—100% humidity, 70°F, 28 days. When temperatures fall, the best way to achieve design strength on the job is to call on the accelerating power of Columbia Calcium Chloride. Write or call Pittsburgh Plate Glass Company, Chemical Division, One Gateway Center, Pittsburgh 22, Pa. Offices in principal cities. In Canada: Standard Chemical Limited.

Columbia Calcium Chloride PPG chemicals

Blacktop pavements need

Jennite J-16®

It improves the appearance of drives, parking lots, play areas . . . doubles service life, reduces maintenance expense . . . protects pavement investment.

MAINTENANCE® INC. WOOSTER OHIO

Write for Bulletin S-2992 Distributors Everywhere

Men and Jobs

Bowman Leaves Drexel; Was Dean of the Faculty

Concluding 35 years with Drexel Institute of Technology, Harry L. Bowman has retired as Dean of the Faculty. He taught at MIT and Purdue University before becoming chairman of the department of civil engineering at Drexel, and subsequently dean of the school of engineering.

After graduating from Pennsylvania State University and receiving a masters degree from MIT, he worked for the Philadelphia and Reading Railway, C. E. Smith, St. Louis consulting engineers, and American Bridge Co. While at Drexel he has maintained an extensive private and public consulting practice.

During the war, Mr. Bowman directed the Physical Damage Division of the U. S. Strategic Bombing Survey and since 1948 has been a consultant on weapons effects for the AEC and the Air Force.

He received an honorary degree of doctor of engineering from Drexel in 1957.

Business

Daniel J. Saunders has opened a consulting office in New York City on water and waste problems. He will also advise manufacturers of engineered products. He was vice president of Pfaudler Permutit, Inc. and is a past president of the Water & Sewerage Works Manufacturers Association and former director of the American Water Works Association.

Donald J. Hall and **J. M. Veggeberg** have joined the staff of Cornell, Howland, Hayes and Merryfield, Corvallis, Ore., engineering firm. Mr. Hall was Newport, Ore., city engineer while Mr. Veggeberg was chief operations analyst of the Chicago Department of Water and Sewers. **William E. Dunlap** and **John R. Weese** were elected general partners of the architectural and engineering firm Skidmore, Owings & Merrill of New York, Chicago, San Francisco and Portland, Ore.

John D. Winter has been admitted to partnership in the New York firm of Dames & Moore, consultants in applied earth sciences. He was in charge of the company's Houston office and will continue to represent them in the southwest.

Herbert J. Leimbach Jr. was named manager of the construction division of the Atlantic Refining Co. where he has been supervisor of the contracting and coordinating section.

William A. Truckenbrod was named president of Truckenbrod & Co. Inc., Buffalo, N. Y., general contractors. He succeeds **August G. Truckenbrod** who will remain as consultant. **George L. Depew** was made general superintendent in charge of construction.

James J. Wolfson has been elected senior vice president in charge of operations for Tishman Construction Corp. of New York. He was a construction consultant to Tishman Realty & Construction Co., Inc.

Robert F. VanHoef has become executive director of the newly-formed St. Paul Metropolitan Improvement Committee, a non-profit organization established to encourage redevelopment of the city. He was director of the Michigan highway department planning division.

Retirements

Joseph W. Gross has retired as Wayne County, Mich., highway engineer after 32 years' service.

Harold M. Myrand, resident engineer at the Corps of Engineers Dallas Dam on the Columbia River retired after 30 years with the federal government.

Clyde N. Dirlam, principal structural engineer of Los Angeles County Building and Safety Division, retired having served 28 years with the division.

Arthur L. Kahl retired as bridge engineer with the Forest Service in the Montana region. He started with the Service in 1934 and received a superior service award from the Secretary of Agriculture in 1957.

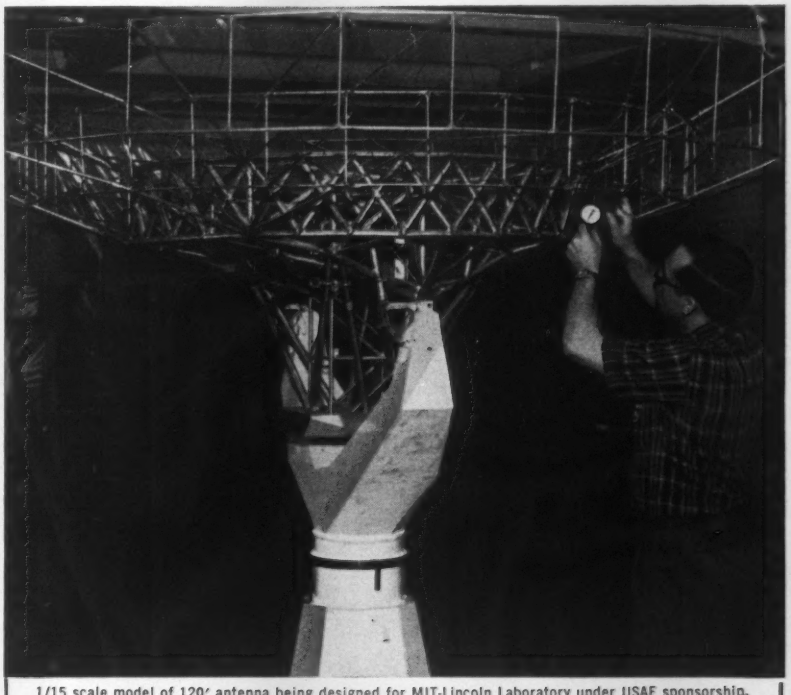
Ethan F. Ball has retired as chief engineer of Bethlehem Steel Company's fabricated steel construction division. He spent 47 years with the company.

Rodney A. Latimer has retired from the Army Corps of Engineers after more than 46 years' service. He was technical consultant to the Mississippi River Commission and to the Lower Mississippi Valley division engineer. Mr. Latimer is known for his part in initiating the extensive bank stabilization program presently under way in the Mississippi Valley.

Leslie J. Sorenson, Chicago's deputy commissioner of streets and sanitation and traffic engineer for the past 20 years, has retired.

Lessley D. Wanee, assistant construction engineer for the California Division of Highways, has retired after 32 years' service with the state.

Henry Ten Hagen retired as chief engineer of the New York State Department of Public Works. He has been with the Department since 1913.



1/15 scale model of 120′ antenna being designed for MIT-Lincoln Laboratory under USAF sponsorship.

New research and development opportunities for Engineers

Currently undergoing static and dynamic tests at NAA-Columbus is a 1/15 scale model of the 120-foot antenna system which will be located on "Haystack Hill" near Tyngsboro, Massachusetts. It is the purpose of this model to verify predictions of the static deflection under inertial loads as well as to determine the antenna's vibration characteristics.

This antenna model is typical of the efforts expended at NAA-Columbus to ensure that static and dynamic structural deflections of such systems are kept to an absolute minimum to ensure the greatest possible system accuracy.

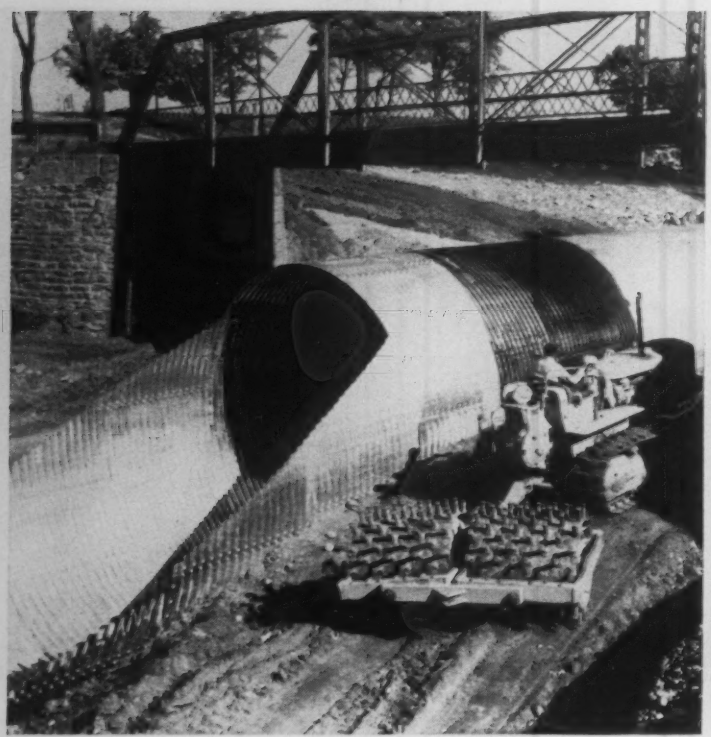
Engineers with advanced degrees interested in Research and Development directed to the prediction of deflection characteristics of such large ground based systems under static (inertial), dynamic (earthquake, winds), and thermal loads are required immediately.

Project Engineers are required to assume full responsibility for Design Engineering of these systems to meet extremely stringent deflection design requirements.

Please send your resume to:
North American Aviation, The Professional & Technical Employment Office, Box EN-417, 4300 East Fifth Avenue, Columbus 16, Ohio, Attn.: Mr. H. Keever.

All qualified applicants will receive consideration for employment without regard to race, creed, color or national origin.

COLUMBUS DIVISION
NORTH AMERICAN AVIATION



1

2

ARMCO MULTI-PLATE DOES BIG

for cities • railroads • local roads

4

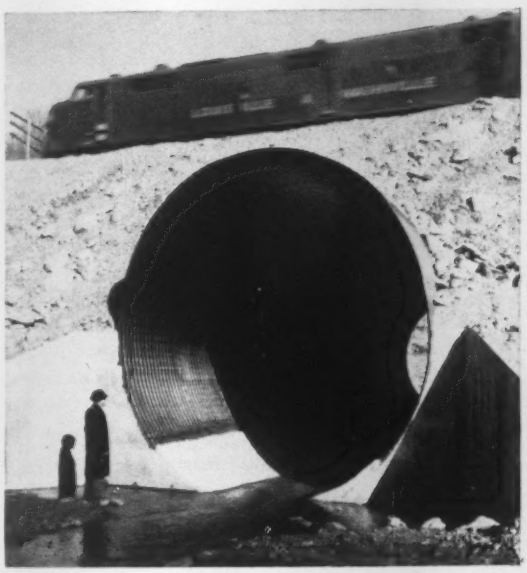
For strength, economy, durability Steel

You Can Rely on MULTI-PLATE® IT'S PROVED IN SERVICE

1. **COUNTY ROAD**
in Greene County, Ohio, gets a most efficient type of bridge replacement job. A giant, 18-foot diameter Armco MULTI-PLATE Pipe plus earth fill replaces a narrow, inadequate truss bridge.

2. **CITY OF ROCKY RIVER**
in northern Ohio, needed a quick and lasting structure to replace a collapsed stone arch. The answer was an Armco MULTI-PLATE Pipe. Notice that installation was made without diverting the stream.

3. **RAILROAD**
elected to "bridge" this stream with Armco MULTI-PLATE. To bypass a failing tunnel on L&N's northern Kentucky section, tracks had to be rerouted over a small, but seasonally hazardous stream. An Armco MULTI-PLATE Structure—20 feet in diameter, 100 feet long—was used to do the job.



3

JOBS AT LOW COST

• interstate highways

4. **INTERSTATE HIGHWAY**
program makes wide use of Armco MULTI-PLATE Structures. Here, backfilling of a 13-foot diameter Armco MULTI-PLATE Pipe is started on Interstate 90 project in Idaho. This particular installation was made by the Armco Construction Department, acting as subcontractor. The special service of the Armco Construction Department makes it possible to buy all Armco Drainage and Construction Products **installed.**

SEND COUPON FOR YOUR COPY OF ARMCO MULTI-PLATE CATALOG

MULTI-PLATE is one of the family of Armco Drainage and Construction Products, made and marketed throughout the free world. Armco Drainage & Metal Products, Inc., subsidiary of Armco Steel Corporation, Middletown, Ohio.

ARMCO DRAINAGE & METAL PRODUCTS, INC.
7881 Curtis Street, Middletown, Ohio

Rush my copy of the latest Armco MULTI-PLATE Catalog

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ARMCO Drainage & Metal Products

ALPHA
BETTER CONSTRUCTION THROUGH BETTER USE OF CEMENTS
news and notes from the field

Overcoming the Problems of Winter Concreting

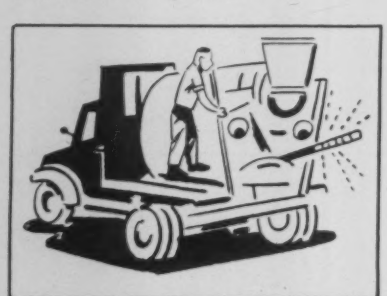
73°F is usually considered to be the practical temperature for hydration, the chemical reaction in concrete that takes place between cement and water. At temperatures higher than that, the rate at which concrete hardens and gains strength is accelerated. At lower temperatures the rate is retarded. At 32°F the rate is very slow, and below freezing there is practically no gain in strength. Successful winter concreting requires that the temperature of the concrete when placed be high enough so that it will harden; and that the concrete be kept at a suitable temperature until it has gained ample strength.

The following precautions will help avoid difficulties and costly failures in cold weather concreting.

Preparing the Subgrade

Concrete should never be placed on a frozen subgrade because of the danger of settlement when the ground thaws. All ice and frost should be removed from inside the forms and from reinforcing steel. This is done best with live steam.

Effects of Temperature



Use heated concrete when air temperature is expected to be 40°F or below within twenty-four hours of concrete placing. The temperature of the heated mix when placing in the forms should be at least 70°F to allow for initial heat loss to forms and subgrade . . . however, the concrete should never be heated over 80°F.

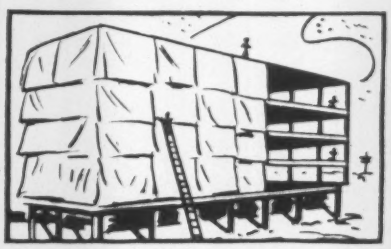
Concrete must be properly placed and adequately protected to avoid damage even though heated concrete is used.

If average daily temperatures are expected to be below 55°F in the next several days, continuous protection is necessary to keep concrete temperature to a minimum of 50°F for at least five days. This is essential as concrete must gain sufficient strength . . . above 1500 p.s.i. . . . to resist the effects of freezing.

When artificial heat is used, the concrete must be protected from drying out. It should also be protected from direct exposure to rain and sleet when heat is removed . . . because *any* water-saturated concrete, less than a month old, is readily susceptible to freeze-thaw damage.

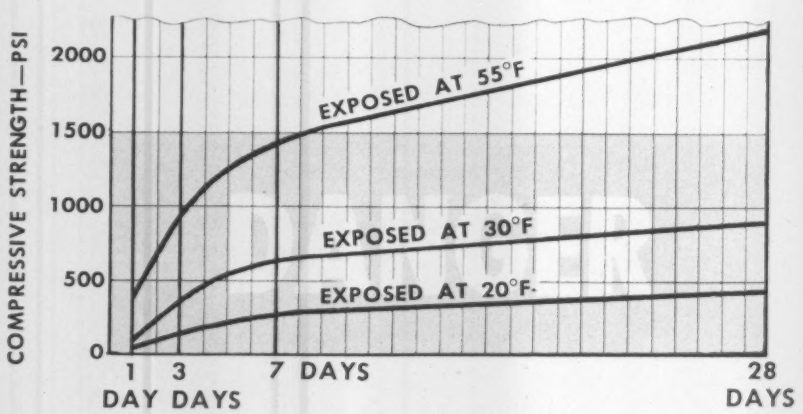
Concrete gains strength slowly at low temperatures. To obtain the given design strength in severe weather, additional cement or Hi-Early cement may be necessary.

Protection of Concrete



In fairly mild weather a covering of tarpaulins may be sufficient protection. A layer of straw covered with tarpaulins will protect against more severe conditions, but an enclosure of tarpaulins or other weathertight material with artificial heat is necessary for proper protection in many cases. Live steam will provide moisture as well as heat. In other cases radiators, unit heaters or salamanders are used.

Oil-burning salamanders used as space heaters require sufficient venting to prevent early damage to the concrete as well as danger to the workmen. They should not be placed directly on the concrete because they can cause localized drying out during the curing period.



Same mix at 70°F temperature would provide 3250 p.s.i. at 28 days.

ALPHA
PORTLAND CEMENT COMPANY
Alpha Building, Easton, Pa.

Obituaries

Miles I. Killmer Dies; Noted Tunnel Builder

Miles I. Killmer, 78, vice president, Mason and Hanger-Silas Mason Co., New York, died Oct. 29. One of the nation's noted tunneling experts, Mr. Killmer took an active part in the company's affairs until very recently.

A 1906 graduate of Pennsylvania State College, Mr. Killmer joined Mason and Hanger in 1928 after having been resident engineer for the Holland Tunnel Authority on the New Jersey end of this pioneer Hudson River vehicular tunnel in New York City. His first jobs with the contracting firm were as general superintendent on subway work, which included the Fulton St.-Cranberry St. tunnel and the Rutgers-Jay St. tunnel. In more recent years he was the contract manager on the first two tubes of the Lincoln Tunnel under the Hudson and on the Manhattan half of the Brooklyn-Battery Tunnel under New York harbor. Shortly after Mr. Killmer was elected vice president in 1941, he also took charge of the company's operations in constructing munition plants for the government.

Patrick Murphy, 32, a structural engineer with Empire Prestressed Concrete Products Co., Portland, Ore. He received a masters degree from the University of Illinois after completing studies on the use of prestressed concrete here and abroad. Mr. Murphy was editor of the OREGON CIVIL ENGINEER during 1959-60.

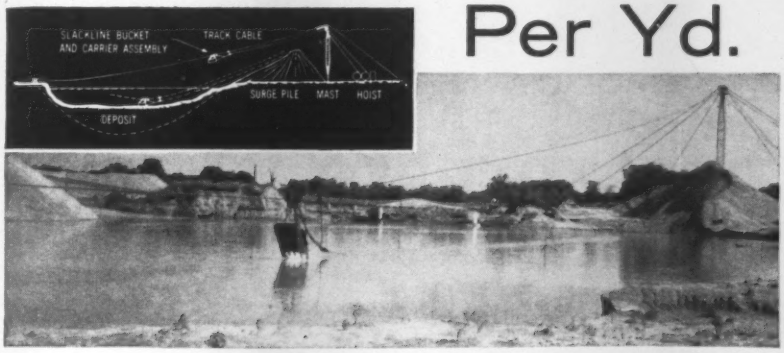
Thomas L. Visintine, 70, vice president and director of the Columbus, Ohio, general contracting firm, Visintine & Co. with which he was associated for nearly 50 years.

Harry W. Eustance, 59, civil engineering consultant for Eastman Kodak Co.

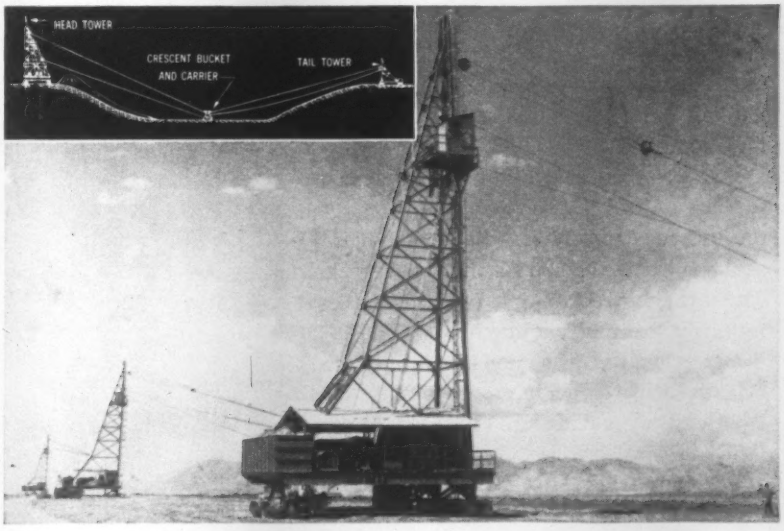
Maurice L. Miller, 65, a consulting engineer in Kentucky where he designed several municipal sewer systems. He was a graduate of the University of Michigan.

William H. M. Laughlin, 62, senior partner in the Toronto consulting firm of Laughlin, Wyllie and Ufnal. Before forming his own firm in 1957, he worked with Proctor, Redfern and Laughlin and was chief design engineer of Dominion Bridge Co. Ltd. Mr. Laughlin was a graduate of the University of Toronto where he was a special lecturer in the department of civil engineering from 1940-47.

Dig and Haul for 8¢ Per Yd.



Sauerman Slackline Cableway excavating hard-to-dig flat rock from 70 ft. of water. Average hauls are 450 ft. to a surge pile which provides a ready reserve for processing. It also allows digging and hauling to continue when the plant or other equipment is down due to weather or other stoppage. Slacklines can dig from ground level to 125 ft. below water, operate over spans up to 1000 ft. Costs from pit to pile average about 8¢ per yd. including labor, power and maintenance.



Sauerman Tower DragScrapers, each equipped with a 5-yd. Crescent bucket, digging and hauling from a lake-bottom deposit. Each 100-ft. head tower is mounted on four sets of tracks. Operating span averages about 1000 ft. The high water table and occasional flooding of the fill area make the job an excellent one for Sauerman Machines, as the wet, sticky material does not provide good footing for wheeled equipment.

Sauerman Machines . . . work high banks . . . deep pits . . . or under water. In most cases, one operator handles digging and hauling from excavation point to hopper or surge pile. Controls can be remotely located for maximum visibility of material and plant.

Request recommendations on your material handling job. Ask for Catalog A for information on Drag-Scrapers in sizes to 15 yds. and Catalog C for information on Slackline Cableways in sizes to 3½ yds.

SAUERMAN BROS., INC. 632 SO. 28th AVE. BELLWOOD, ILL.
Linden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

savings
soar with

PRESTRESSED CONCRETE

in Kansas' biggest—
The
Wichita Plaza
Building

The 19-story Wichita Plaza Building in downtown Wichita is Kansas' largest and tallest commercial building and represents advanced thinking in the use of new and efficient structural components.

For example, ten levels of floors were constructed of 1,873 Mono-Wing, or F-section, prestressed concrete slabs—a total of 218, 271 sq ft —all delivered and installed in 17 weeks. The saving in erection time resulted in a cost far below that inherent in other materials.

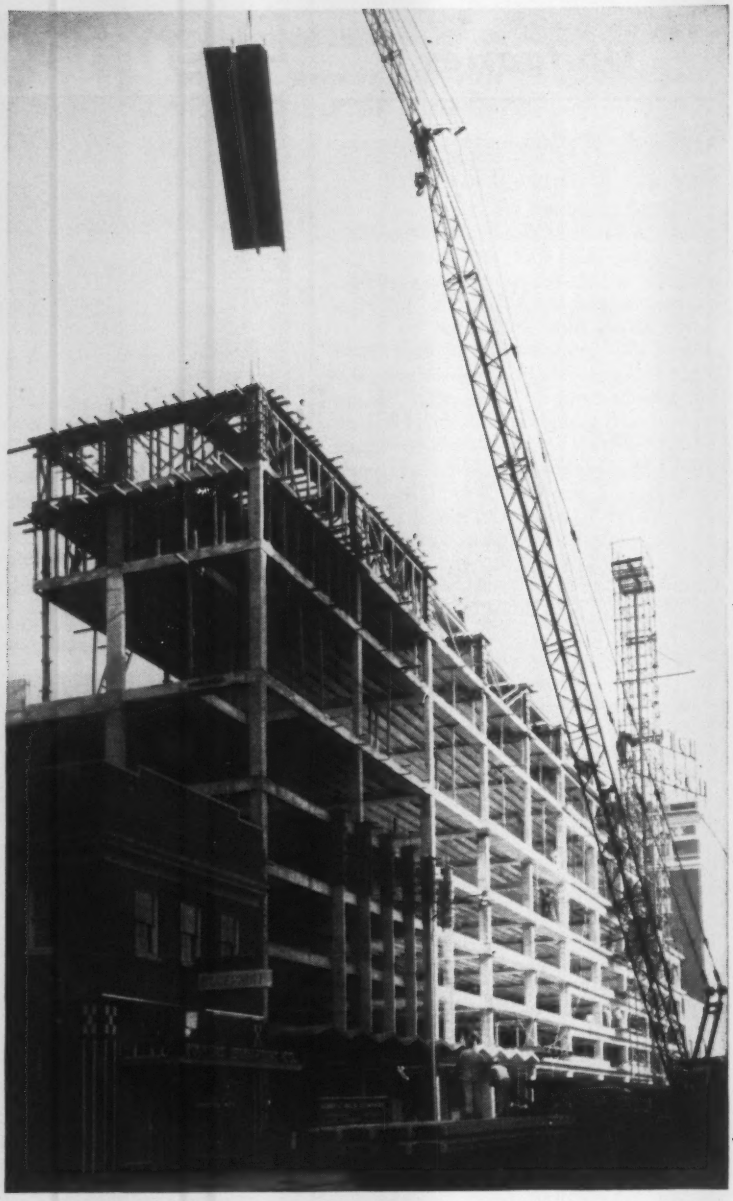
But time saved in erection is only one of the benefits achieved with prestressed. It cuts labor costs by making jobs easier for the pipe trades in heating, plumbing, air conditioning and conduit work. It keeps foundation costs down by reducing excessive dead weight. And it provides the long-term benefits of strength, permanence, low maintenance and the high efficiency obtained by column-free space.

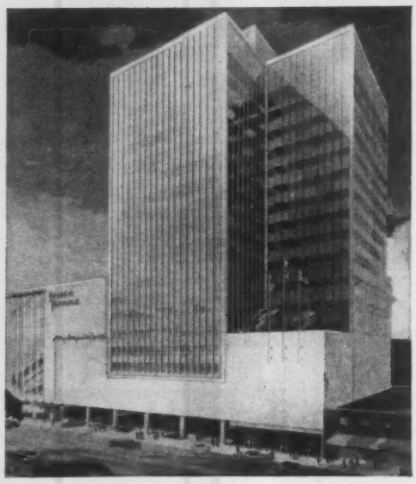
Roebling can tell you what you want to know about prestressed concrete. We pioneered the method and make the finest prestressing wire and strand. Feel free to ask us for data and shirt-sleeves help in planning its use in any type of building. Roebling Construction Materials Division, Trenton 2, N. J.

Roebling's New Reel-less Pak Saves Fabrication Time and Money

ROEBLING

Bronch Offices in Principal Cities
John A. Roebling's Sons Division
The Colorado Fuel and Iron Corporation





Above: Prestressed light weight concrete Mono-Wing slab being placed in the Wichita Plaza Building. **Left:** Architect's drawing of the building, which is to house ground floor retail areas, a 425-car inside garage, a 140-room motor hotel, a swimming pool-ice skating rink, and 160,000 sq ft of office space. Architect: Walter Ahlschlager Sr.; Contractor: Henry C. Beck Company; Structural Engineer: Jack Murlin, All of Dallas, Texas; Prestress Consultant: Ross H. Bryan, Nashville, Tenn.; **Prestressed Concrete Producer: United Prestress Company, Wichita, Kansas.**

Books

Construction History

AMERICAN BUILDING ART—THE TWENTIETH CENTURY—By Carl W. Condit. 427 pp. Oxford University Press, New York 16, N.Y. $15.

If we want to know where we are going, we sometimes can get a good idea by looking back at where we've been. For this purpose, the history of 20th century construction by Carl W. Condit, a Northwestern University professor, is excellent.

A continuation of American Building Art—The Nineteenth Century, the new book describes contemporary buildings and bridges in steel and concrete, dams and highways. The treatment is unusual in that it discusses problems faced by the designers and builders and indicates the solutions adopted.

Where Mr. Condit deals with events and structures, he has done a fine job of research and reporting. But his interpretation of these events and his comments on the accomplishments of the construction industry in the 20th century are not up to the same high standard, particularly in the introduction. There you will find such statements as: "The social character of the United States still tends to be unconducive to original speculation and experiment . . . It is nevertheless true that even the greatest monuments of contemporary engineering represent the culmination of progressive refinements of well established techniques . . . The automobile has created more problems than it has offered advantages."

Just Published

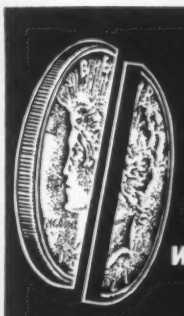
ECONOMIC COST OF TRAFFIC ACCIDENTS—Highway Research Board Bulletin 263. 53 pages. National Academy of Sciences, 2101 Constitution Ave., Washington, D.C. $1.40.

PAVEMENT EDGE MARKINGS, SHOULDERS AND MEDIANS—Highway Research Board Bulletin 266. 125 pages. National Academy of Sciences, 2101 Constitution Ave., Washington, D. C. $2.80

INCOME AND SALARY SURVEY, 1960—National Society of Professional Engineers, 2029 K Street, N.W., Washington 6, D. C. $1.00 for members, $2.00 non-members.

STRESS DISTRIBUTION IN HYPERBOLIC PARABOLOIDAL SHELLS UNDER CONCENTRATED LOADS—by H. P. Harrenstein and Gungor Tascioglu. Iowa State University Bulletin No. 197, Ames, Iowa. $1.50

BUILDING CODE REQUIREMENT FOR REINFORCED MASONRY—National Bureau of Standards Handbook 74. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 15 cents.



CUT WATER SUPPLY COSTS with REDA Submergible PUMPS

. . . and still obtain maximum water supply and maximum pressure for ALL your water needs. Here's Why:

1. QUALITY CRAFTSMANSHIP . . . Yet production line cost . . . A complete line of 2-pole and 4-pole models to meet operating heads and capacities required. Both electric, submergible motor and pump are REDA manufactured.

2. Oil lubricated motors require less power per H.P. PROVIDE MORE WATER PER DOLLAR than comparable units.

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PUMP TYPE	UNIT O. D.	DESIGN CAPACITY GPM	DESIGN LIFT HEAD IN FEET	
			MAXIMUM	MINIMUM
D-47E	6"	55	2000	200
G-70E	6"	72	5400	180
G-120A	6"	110	3500	105
G-160	6"	150	2750	82
I-200	8"	210	2000	54
FR-300	8"	325	1250	54
J-400	8"	480	780	60

PUMP TYPE	UNIT O. D.	DESIGN CAPACITY GPM	DESIGN LIFT HEAD IN FEET	
			MAXIMUM	MINIMUM
GB-600	10"	600	600	60
KG-725	10"	800	490	69
N-500	10"	425	1100	30
N-750	11"	(c)600*	1000	30
		(a)700		
P-1000	12"	1200	1000	46
R-1500	14"	1800	700	65
T-2000	16"	2250	600	85

*(c) and (a) designate impeller cut within the same pump type.

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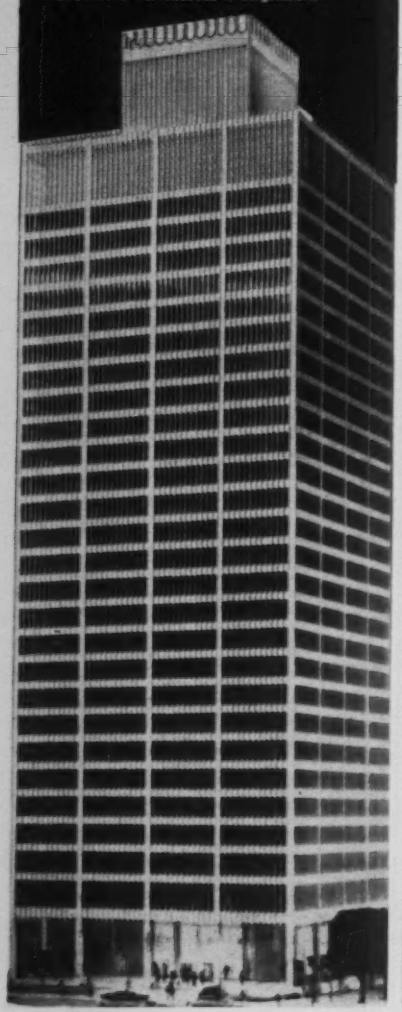

. . . Books

SOILS MANUAL FOR DESIGN OF ASPHALT PAVEMENT STRUCTURES—Manual Series No. 10, published by the Asphalt Institute, College Park, Md. 176 pages and appendixes.

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS—National Joint Committee on Uniform Traffic Control Devices. 333 pages. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. $2.00

NATIONAL FIRE CODES. 7 volumes, 5846 pages. Vol I: Flammable Liquids and Gases. Vol. II: Combustible Solids, Dusts, Chemicals and Explosives. Vol. III: Building Construction and Equipment. Vol. IV: Fixed Extinguishing Equipment. Vol. V: Electrical. Vol. VI: Transportation. Vol. VII: Mobile Fire Equipment, Organization and Management. National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass. $7 per vol, or $40 for 7 vols.

UNIT OPERATIONS OF SANITARY ENGINEERING—by Linvil G. Rich. 308 pages. John Wiley & Sons, 440 Park Ave. South, New York 16, N. Y. $10.75

INDUSTRIAL PLANT PROTECTION. PLANT PROTECTION SERVICE OPERATIONS MANUAL OM16-1, 1961. New York State Civil Defense Commission. 85 pages.

MUNCIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. Public Health Service Publication No. 775. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Region I-50¢, Region II-75¢, Region V-70¢, Region VII-60¢

GRANTS-IN-AID AND OTHER FINANCIAL ASSISTANCE PROGRAMS ADMINISTERED BY THE U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE. Superintendent of Documents, Government Printing Office, Washington 25, D. C. $1.50.

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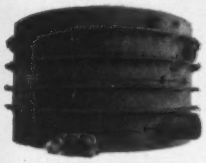

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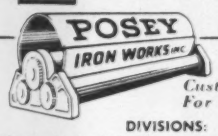

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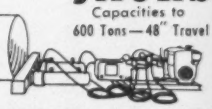

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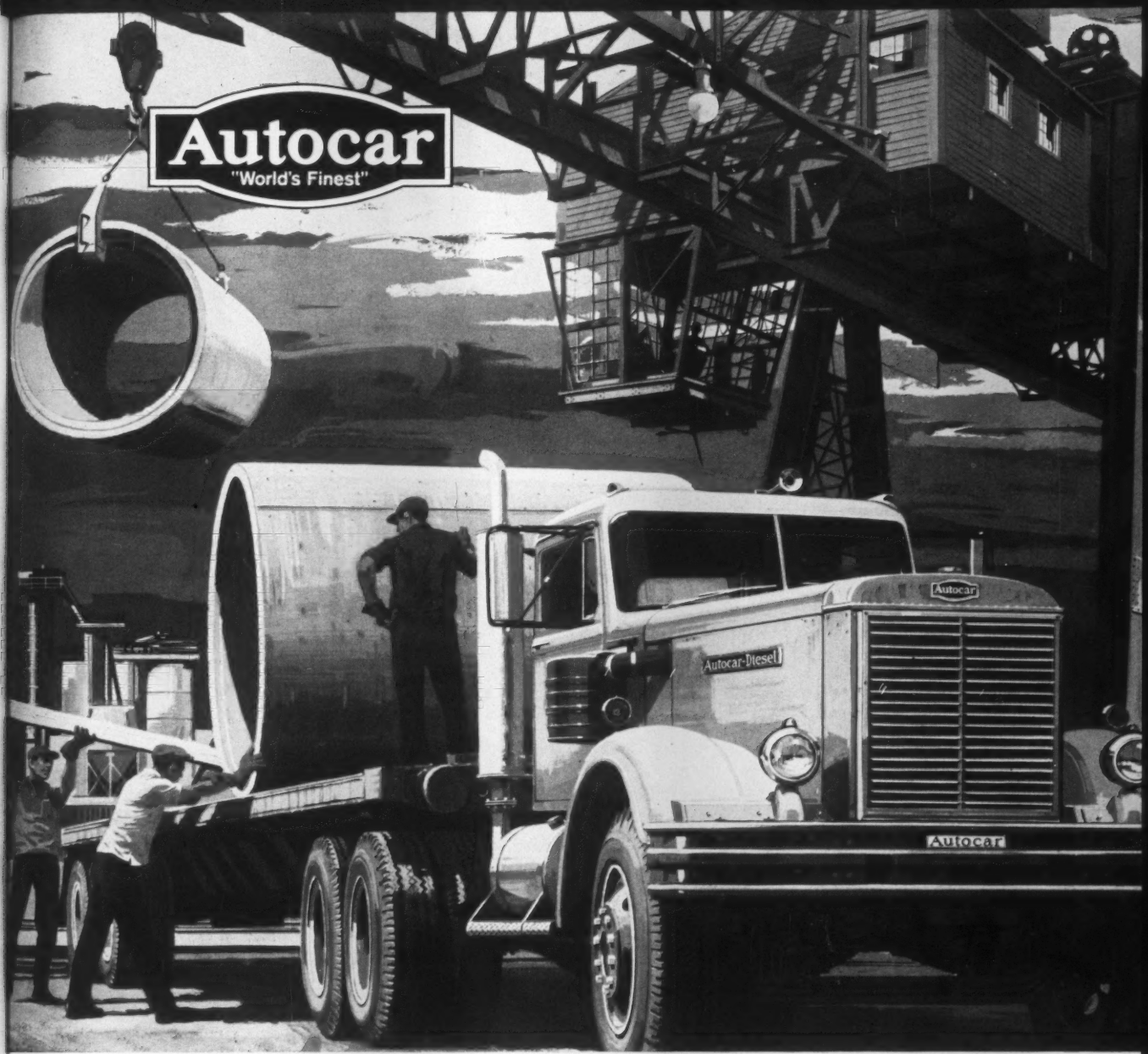

American Pipe & Construction Company operates Autocars over the vast stretches of the West and Far West. One primary reason for recently ordered A-10264's is the outstanding WHITE-AUTOCAR service organization.

Tough construction hauling built Autocar's name

And WHITE-AUTOCAR comprehensive service backs up Autocar's fame as the "World's Finest". It's a combination that makes Autocar pay off most profitably in the rugged work of construction and building-material hauling.

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low maintenance...

BRUISING STRENGTH!"

That's how B. L. Anderson sums up the dependable performance of his 5 Link-Belt Speeder rock shovels

Not too long ago we looked in on one of the midwest's most progressive quarry operators. Purpose of the visit? Ask B. L. Anderson how his year-old Link-Belt Speeder LS-98 one-yard rock shovels are doing in his multiple quarry operation in Iowa.

WHAT ABOUT CAPACITY?

"We're getting more than we expected. We're surprised at their high capacity. We lean strong to a two-shovel operation — one on each side of the crusher. We're now feeding about 300 tons an hour with the Link-Belts . . . could load up to 4,000 tons a day.

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"We're happy with the low maintenance. The heavy dust doesn't bother the clutches. Our operators spend very little time adjusting the clutches.

"These rigs are built to take a pounding. Before we got our Link-Belts we used to come in for repairs at the end of the year. We won't be coming in this year!"

WHAT ABOUT POWER?

"Plenty of that! Our engines are equipped with hydraulic couplings for better shock absorption. Even with the heaviest loads we don't stand the rigs on end."

No matter where we go, who we ask, the answer is the same: "Link-Belt Speeder rock shovels give you peak capacity and profits, less trouble." See your Link-Belt Speeder distributor for full details. Or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 105-61N

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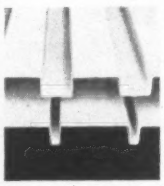

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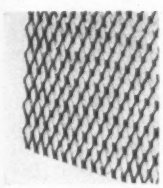

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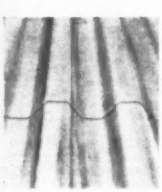

6 Wheeling Tensilform® for conventional self-supporting concrete slabs...eliminates shoring and gives structures excellent lateral stability.

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Watch Your Contract Language

Courts use a variety of rules in interpreting contracts. Generally, they try to follow the apparent intention of the parties to the contract.

In a Federal Court case,[1] the court set forth the following rules that are used: "It is a cardinal rule in the construction of contracts that the court must, if possible, ascertain and give effect to the mutual intention of the parties, so far as they may be done without contravention of legal principles, statutes, or public policy.

"The intention of the parties to the contract is to be gathered from a consideration of the contract as a whole.

"In the absence of ambiguity the intention of the parties must be ascertained from the language used in the written contract, without resort to parol evidence or extrinsic circumstances.

"A contract is ambiguous where, upon the consideration of the contract as a whole, the provisions in controversy are susceptible of more than one meaning."

The Federal Court, in another case[2] held that under Indiana law, a contract which is without ambiguity will not be rewritten by the courts for the benefit of a third-party claimant and that one who seeks to enforce a contract for his benefit must show that he has performed all conditions on his part required to be performed as a condition precedent to his right to recover. The court also stated: "It has long been settled in Indiana law that the performance of a contract, or the offer of performance, after a suit has been brought for breach thereof, will not act as a bar to prosecution of the pending suit."

In a Connecticut case,[3] the court held that in determining the intent of the parties to a contract, the court considers not only the language used in the contract but also the circumstances surrounding the making of the contract, the motives of the parties and the purposes that the parties sought to accomplish under the contract. The practical construction indicated by the parties to the contract over a period of time is evidence of intent of the parties, but such conduct, however, cannot prove an intent contrary to the plain meaning of the language used in the contract.

(1) Dipo v. Ringsby Truck Lines, 282 F. 2d 126.
(2) Potomac Insurance Company v. Stanley, 281 F. 2d 775.
(3) Connecticut Company v. Division 425, etc., 164 A. 2d 413.

Arbitration Clause Bars Lawsuit

An arbitration clause in a construction contract may preclude resort to litigation.

A recent New York case treats such a clause as an exclusive remedy. The facts were these:

A contract provided that all disputes, claims or questions arising out of the contract should be submitted to arbitration. The contract also provided that the disputes should be submitted to the architect as a preliminary to the right to arbitrate.

The contractor, instead of taking the steps required by the contract to arbitrate its dispute, brought an action to recover on the claim. The other party made an application to the court to stay the action. The request was granted.[1]

The party bringing the action contended that the other party made no request to the architect to decide the controversy and, by its action, had waived the right to claim that the dispute should be settled by arbitration.

The court held that the right to stay the action was not waived by the failure of the other party to request the architect to decide the controversy or to demand arbitration. It was the claimant's obligation under the contract to initiate the preliminary steps to arbitration rather than to institute an action, the court said.

(1) Cummings v. Walmar Builders, Inc., 201 N.Y.S. 2d 251, N.Y. Supreme Court, April 1, 1960.

These summaries of court decisions are prepared by I. Vernon Werbin, Esq., New York attorney and licensed professional engineer, who is author of the following books published by McGraw-Hill Book Company, Inc.: *Legal Phases of Construction Contracts; Legal Guide for Contractors, Architects and Engineers;* and *Legal Cases for Contractors, Architects and Engineers.*

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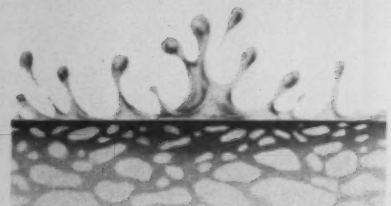

FLUAT is a clear liquid that penetrates deeply into the pores of new or old concrete, where it reacts with the free lime and calcium carbonate to turn these relatively soft compounds into extremely hard, insoluble silicates. These silicates completely fill and seal the concrete pores, creating a very dense and hard surface which actually increase the overall strength of a concrete floor!

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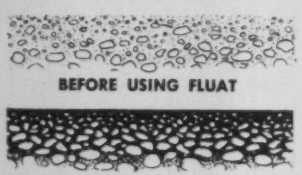

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Dewatering costs boost price of . . .

Illinois Pumping Station Job

The location of a $1,022,011 pumping station—500 ft from the Mississippi—saddles the contractor with some tough construction problems. All of the construction work must be done in the dry, and excavations kept free from water. But bottom of the pumping station's excavation is 12 ft below the Mississippi River flat pool, and 22 ft below the average ground water table. Add sandy, porous, soils that allow water to seep freely into excavations plus seasonal shifts in the water table, and you have a sizeable dewatering job.

Protection and dewatering account for $130,000, or 13% of cost. LaCrosse Dredging Corp., Chicago, was low, 4% under E. J. Albrecht Co., Chicago, and 26% under the high of seven. The job is for the Corps of Engineers.

Basic wage rates include: common, $3.025; structural ironworkers, $3.975; electrical workers, $4.26.

The bidding included:

1C LaCrosse Dredging Corp., Chicago, Ill.	$1,022,011
2 E. J. Albrecht Co., Chicago, Ill	1,068,123
7 Continental Constr., Inc., St. Louis, Mo	1,387,283
EE U. S. Corps of Engineers	1,068,442

Bids: 7-17-61 Items	Unit	Quantity	Unit Prices 1C	2
Clear & grub	ls	job	15,000	$30,000
Excavation, discharge channel	cy	26,600	0.5	0.506
approach channel	cy	113,800	0.56	0.50
str	cy	18,700	0.60	1.20
Backfill, str	cy	4,100	1.20	1.00
Excavation, for pipelines	cy	1,065	2.00	1.50
Backfill, pipelines	cy	1,550	2.00	1.50
Excavation, roadways	cy	50	1.25	1.00
Embankment, roadways	cy	935	1.25	1.00
levee	cy	9,850	0.85	1.00
Concrete, mass	cy	1,100	52.00	60.00
wall	cy	740	95.00	120.00
footing & slab	cy	1,310	40.00	32.00
fill for piles	cy	150	32.00	20.00
Portland cement	bbl	5,435	5.00	5.25
Steel reinforcement	lb	316,350	0.155	0.16
Water stops	lf	500	6.00	5.00
Piling, vertical	lf	2,335	5.40	6.00
batter	lf	4,590	5.65	8.00
Splices	ea	16	40.00	40.00
Recording sys, water level	ls	job	1,725	1,200
Building	ls	job	47,000	31,000
Steel & cast iron, misc	lb	21,685	0.60	0.50
Pumping equip, install	ls	job	15,000	15,000
Piping, pump discharge	ls	job	95,100	71,000
Cooling sys, water	ls	job	25,300	20,000
Compressed air sys	ls	job	13,400	11,000
Fuel oil sys	ls	job	18,200	20,000
Discharge siphon priming sys	ls	job	49,500	41,000
Heating & ventilating sys	ls	job	3,000	3,000
Trash rack	ls	job	22,000	26,000
cleaning mech	ls	job	12,000	9,000
Crane	ls	job	11,500	8,000
Electrical work & equip	ls	job	15,000	12,500
Road surfacing	sy	1,430	1.50	1.25
Top soiling	cy	834	1.50	1.30
Seeding	sy	7,500	0.10	0.10
Riprap	cy	2,350	10.00	8.00
Wells, pressure relief	lf	440	15.50	13.00
Riser pipe, wood stave	lf	80	6.00	5.00
Well screen, wood stave	lf	340	6.25	5.20
Outlets, outflow pipe, CMP 12"ϕ	lf	117	10.00	8.00
well guard, CMP, 24"ϕ	lf	70	14.50	12.00
cover plates & i.	ea	5	175.00	160.00
Filter, gravel	lf	380	8.40	7.00
Backfill, pressure relief wells, concrete	lf	40	11.50	10.00
other than concrete	lf	34	2.50	2.00
Pump test, 2 hr	ea	5	160.00	140.00
additional	hr	30	17.00	15.00

Bids: 7-17-61 Items	Unit	Quantity	Unit Prices 1C	2
Field office, temporary	ls	job	1,700	2,000
Drains	ls	job	1,000	800.00
Fence	ls	job	3,400	3,000
Fill, gravel	cy	30	10.00	6.00
Supplies	ls	job	1,500	1,500
Protection & dewatering	ls	job	130,000	200,000
Filter blanket	cy	5,350	8.50	8.00
Sluice gates	ls	job	16,500	20,000
Backfill, sand	cy	1,150	6.55	6.00

Starting date: October 1961
Completion date: June 1963

ENR Constr. Cost Index (1913 = 100) 20-cities avg.–853.64

TVA Concrete Bridge

Construction of a $2,861,841 bridge over TVA's Pickwick Landing Dam in Hardin County, Tenn is hampered by two 80-ton gantry cranes operating on the deck of the dam. To clear the cranes, the contractor will use rigid frame bents with new concrete brackets supporting the frame columns.

Markwell & Hartz Contractors, Memphis, took the award 4.3% under John F. Beasley Construction Co., Chicago, and 31% under the high of 10.

The bridge will be 3,671 ft long and will carry a 28-ft roadway with two 5-ft sidewalks. The roadway will be 58 ft above the dam's deck.

Union wage rates include: carpenters, $3.450/hr; laborers, $2.050/hr.

The bidding included:

1C Markwell & Hartz Contr., Memphis, Tenn.	$2,861,841
2 John F. Beasley Const. Co., Chicago, Ill	2,989,224
10 Clark Const. Co., Owensboro, Ky	4,120,042
EE Tennessee Valley Authority	2,946,000

Bids: 7-14-61 Items	Unit	Quantity	Unit Prices 1C	2
North Approach				
Exc, for str	ls	job	$6,400	$31,000
Conc, cl A	cy	1,450	74.00	73.00
Steel, reinf	lb	327,500	0.13	0.12
str	ls	job	305,000	330,000
Railings & fence, alum	ls	job	20,000	15,000
Drainage, roadway	ls	job	36,463	30,000
Piling, steel bearing	lf	1,686	8.00	8.00
Lighting, bridge	ls	job	12,000	14,000
Bridge Over Concrete Dam				
Exc, for str	ls	job	3,200	16,000
Conc, cl A	cy	3,600	85.50	75.50
Steel, reinf	lb	912,500	0.13	0.12
str	ls	job	1,228,000	1,255,000
Cables, post-tensioning	ls	job	4,400	35,000
Railings & fence, alum	ls	job	45,000	42,000
Drainage, roadway	ls	job	79,369	95,000
Piling, steel bearing	lf	1,510	8.00	8.00
Conc, exist, remove	ls	job	14,100	50,000
Miscellaneous work	ls	job	33,046	60,000
Lighting, bridge	ls	job	33,000	34,000
South Approach				
Exc, for str	ls	job	3,400	23,000
Conc, cl A	cy	990	74.00	77.00
Steel, reinf	lb	254,000	0.13	0.12
str	ls	job	232,000	210,000
Railing, alum	ls	job	10,000	12,000
Drainage, roadway	ls	job	19,819	28,000
Piling, steel bearing	lf	7,312	8.00	8.00
Lighting, bridge	ls	job	10,000	12,000

Completion: in cal. days, north approach–360; bridge over concrete dam–360; south approach–720

ENR Constr. Cost Index (1913 = 100) 20-cities avg.–853.64
ENR Building Cost Index (1913 = 100) 20-cities avg.–570.86

Materials Prices

Monthly Market Quotations By ENR Field Reporters

Iron and Steel Products–F. O. B. Warehouse, Per 100 lbs., Base Price

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles##	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
Struct. shapes	Cwt	$7.52–8.15aV	$9.70	$9.00ty	$8.00–9.30KssV	$7.07–8.34ysV	$7.64–8.91styV	$7.46–8.73tysV	$7.51–9.18MsV	$8.24cK	$7.64–8.91M	$9.90sT	$8.70–10.45kteV	$7.78–8.17ysV		$7.85–9.13Vss	$7.35–8.40zsV	$7.07–8.34syV	$7.30–8.57stxyV	$9.40–11.25ssV	$8.60–10.80aDsV	$7.90–8.60CF/8.20–8.90AiF	$8.90H
Reinf. bars, new steel	"	7.57	9.00T	6.81syV	8.75t	6.30–6.45guV	8.21tf		8.50	9.35	7.37–11.55	8.21N	7.35frt	9.26T	$8.00gktz	8.60ty	7.93uy	7.35y	7.35#txQ	8.25jS	9.00DM	7.00/7.50FGi	7.80
Reinf. bars, rail steel	"			6.81syV	8.75t	6.30–6.45guV								9.26T		8.60y	9.30y		7.35#txyQ			7.00/7.50FGi	7.80
Expanded metal lath k std. diamond mesh, 3.4 lb	"	41.50	44.50	61.00pK	47.00K	52.00#U	44.50Kg	43.50KL	44.50u	53.00n	67.00 O	51.00	55.00S	43.50K	64.50K	50.00n	45.50#U	58.50#rw	64.00wxK	53.00S	67.00#nD	65.700h	49.50qI
std. ribbed, 3.4 lb.	"	49.00S	49.00	67.00pK	51.00K	63.00#U	48.50mnKg	47.50KL	49.00w	58.00n	74.00 O	55.00	64.00S	47.50K	61.00K	58.00no	50.00#U	64.50#rw	65.00wxK	58.00S	73.50#nD	70.20h	44.85qI

Reinforcing Bar Extras, per cwt, N. Y.–• Quantity (applies to LCL shipments only): under 1,000#, +$1.80; 1000–1999# +$1.50; 2000–4999#, +$1.20; 5000–9999#, +90¢; 10,000–19,999#, +60¢; 20,000–29,999#, +30¢; 30,000–39,999#, +10¢; 40,000# & up, none. • Size†: #2 +$2.50; #3 +$1.40; #4 +$1.00; #5 +70¢; #7, #8, #9, #10, #11 +50¢ • Bending: heavy, +90¢; light +$2.20 (except in New York City and surrounding metropolitan area where bending must be done on the job). • Engineering (details and placing from designs by others): over 500 tons, +45¢; 200–499 tons, +50¢ but not over $4500; 75–199 tons, +65¢ but not over $2000; 20–74 tons, +75¢ but not over $975; 5–19 tons, +85¢ but not over $300; under 5 tons, +$1.00 but not over $85. Min. charge $25. Design only: +60¢.

Structural Shape Extras, per cwt, Chicago, Cincinnati, Cleveland, Dallas, Detroit, New York, Philadelphia, St. Louis and Pittsburgh. Item; 10,000# and over, base, 5,000–9,999#, +10¢, 2,000–4,999#, +35¢, 1,000–1,999#, +85¢, 400–999#, +$1.75, 100–399#, +$1.75, under 100#, +$1.75. Order: 20,000# and over, base, 10,000–19,999, +25¢, 5,000–9,999, +65¢ 2,000–4,999, +$1.50, 1,000–1,999, +$2.50, 400–999, +$4.00, under 400, +$8.00. Item extras do not apply in Chicago, Cleveland, Cincinnati, Detroit and St. Louis. ## Delivered. •• Aver. of Canadian & American. ††† add 4% sales tax. •a 2000–4999#. •b 10,000–19,999#, fob city. •c 20 tons or over. •d 10,000–29,999#. •e Intermediate struct'l. •f incl. delivery in free zone. •g CL. •h list price; dominion tax exempt; add provincial and municipal taxes. •i add provincial and municipal sales taxes. •j intermediate and hard grade. •k fob city. •l delivered; contractor to do unloading. •m copper alloy. •n LCL. •o asphalt coated. •p 500 sq yd. or more. •q 2.5 lb. •r less 2% disc. for cash. •s 10,000# item in 20,000# order. •t less ½% disc. 10 days. •u add 10¢ switch. •v incl 15¢ del. •w truck lots. •x add 2% sales tax. •y add 15¢ del. •z add 10¢ del. •A American made. •B Canadian made. •C Canadian made. •D ½% for cash. •E 30,000# or over. •F Federal tax exempt for bldgs. •G add 10¢ del. •H $8.85 without tariff charges. •I 3 lb $80.00. •J 4 lb $47.50. •K less 2% disc. 10 days. •L F.o.b. Youngstown plant. •M 5,900–9,999#. •N 2,000–19,999#. •O 100 sy lots. •Q 5 tons to CL. •R revised. •S less 2% disc. 10th. •T less ½% disc 10th of mo. •U less 2% disc. 10 days. •V varies according to type and size. •W add 3% sales tax

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Oct. 19; Next, Nov. 23
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Oct. 26; Next, Nov. 30
- Wage Rates, Building Board, Lath, Insulation: Last, Nov. 2; Next, Nov. 30
- Cement Aggregate, Ready Mixed Concrete Asphalt: Last, Nov. 9; Next, Dec. 7

Iron and Steel Products–Base Mill Prices Carlot Quantities

Item	Unit	Birmingham area	Chicago area	Pittsburgh	Buffalo area	Cleveland	Youngstown area	Geneva	Los Angeles	Pueblo
Struct. Shapes	cwt	$5.50	$5.50	$5.50	$5.50			$5.50	$6.20	
Plate Carbon Steel	"	5.30	5.30	5.30	5.30			5.30		
Reinf. Bars (billet)*	"	5.675	5.675	5.675	5.675	$5.675	$5.675		6.375	
Rivets, ½" struct	"	12.25	12.25	12.25	12.25	6.50			6.50	
Sheet Piling (base)	"		6.50	6.50	6.50					
Steel Rails, standard	Ton	110.50	110.50	110.50	110.50					
light	"	130.00	130.00	130.00	130.00					
Track Supplies										
Angle bars	cwt	6.975	6.975	6.975	6.975					
Std. spikes	"	9.75	9.75	9.75	9.75		9.75		9.75	$6.975
Tie plates	"	6.60	6.60	6.60	6.60				6.875	6.60
Track bolts	"			14.75	14.75	14.75				

* Fairless Works, $5.825 Revised. These prices are nominal. Major reinforcing bar producers now quote prices on the basis of individual inquiries.

*WROUGHT STEEL PIPE (Full standard weight) Discount from list; see footnote

Mill	2½ & 3 in.* Black %	2½ & 3 in.* Galv. %	3½ to 6 in.* Black %	3½ to 6 in.* Galv. %
Lorain, Ohio	13.75	+3.50	+1.75f	+19.50f
Aliquippa, Pa.	13.75	+3.50	3.25a	+14.50a
Sparrows Pt., Md.	17.25	+List		
Benwood, W. Va.	13.75	+3.50		
Youngstown, O.	13.75	+3.50	3.25	+14.50a
Indiana Harbor, Ind.	12.75	+4.50	2.25ab	+15.50a
Sharon, Pa.	13.75	+2.50	3.25ab	+13.50ab
Wheatland, Pa.	13.75	+3.50	3.25a	+14.50a
Etna, Pa.	13.75	+3.50	50de	
Fontana, Calif.	0.75	+16.50b	+9.75ab	+27.50ab

* Threaded and coupled: a 3½ to 4 in. b to 1, 5 and 6 in. c 6 in. d Seamless 5 in.

WROUGHT STEEL PIPE, butt or continuous weld: Deduct (+) or add (–) these "discounts" from or to the following carlot list prices to get mill prices. Price per ft. (based on approx. $200 per net ton): 2½ in., 58¢; 3 in., 78½¢; 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight for destination price.

WROUGHT IRON PIPE, lap weld: List prices per ft. same as for wrought steel pipe, but add these "discounts" to get Pittsburgh mill price. 2½ to 3 in., black 106%; galv. 139%; 4 to 6 in., black 103%; galv. 133%. Add freight for destination price.

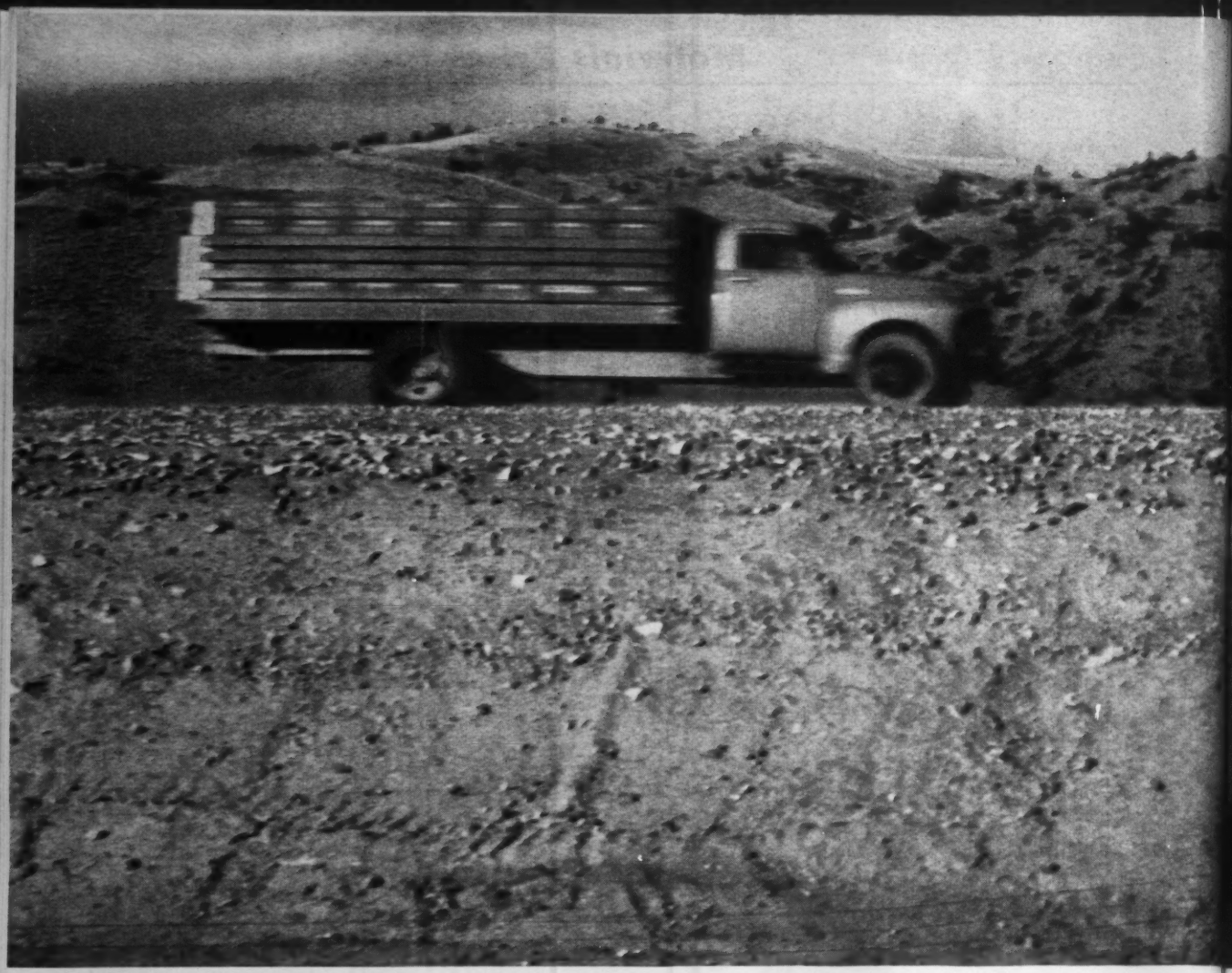
WELDED FABRIC REINFORCING, FOB Joliet, Ill., Donora, Pa., Monessen, Pa. mill, per 100 sq. ft.: 4 x 18 in., No. 5 & 10 wires . . . $7.04; 4 x 12 in., No. 8 & 12 wires . . . $2.62; 6 x 8 in., No. 6 & 6 wires . . . $4.17

Plumbing, Heating, Water, Sewer Pipe and Tubing

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles##	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
C. I. Pipe Price Index	a	130.6	140.2	125.8	143.2	140.0	135.6	141.8	137.9	145.1	142.1	138.6	148.6	145.0	132.4	138.6	137.9	142.9	135.7	148.6	149.0		
Asbest. Cem. Pipe, 6"	lin. ft.	1.51	1.51	1.51	1.51	1.51	1.63	1.63	1.59	1.59	1.51	1.51	1.59	1.51	1.51	1.51	1.51	1.51	1.48	1.59	1.59		
Asbest. Cem. Pipe, 12"	" "	2.36	2.19	2.26	2.19	2.19	2.19	2.19	2.26	2.36	2.19	2.26	2.19	2.26	2.26	2.19	2.19	2.19	2.26	2.19	2.19		
Clay Sewer Pipe																							
8 in. ASTMC 13-55	ft.#	0.571rn	0.665	0.50r	0.84qrtL	0.93rm	0.595	0.66BCN	0.575#B	0.56nr	0.97nk	0.641r	0.86bl	1.05oB	0.602r	0.94	0.75	0.94K	0.63r	0.86#d	0.91bk	1.13u	0.76F
12 in. "	"	1.09rn	1.20	0.95r	1.55qrtL	1.78rm	1.15	1.27tBC	1.09#B	1.00nr	1.86nk	1.148r	1.86bIS	1.90oB	1.45r	1.76	1.44#	2.01K	1.26r	1.86#d	1.94kb	2.00u	1.43F
24 in. ASTMC 200-55T	"	4.67rn	3.05	4.14rw	6.39qrtM	7.52rm	4.95	8.47tBC	4.75#B	4.98r	7.48nk	6.354br	7.55bIS	8.00oB	5.96r	12.89	9.49#v	8.79K	5.20r	7.53#d	7.78k	7.00u	5.70F
36 in. "	"			13.50rw		21.16rm	14.35	23.45tBC	10.53#bB		19.95nk		16.39bIS			35.61	25.73#v	24.15K	13.25rS	18.00#d		13.50u	
Clay Drain Tile 6 in. V	M ft.	200.00sr	187.80	295.00rx	244.00r	220.00Br	177.50	179.40mBC			212.00mk	327.00r	410.00IS		261.50pr	240.81	225.00#	190.00	170.00r	360.00#l	260.00ck	288.00	175.00F
8 in. V	M ft.		289.20	430.00rx	348.60r	330.00Br	274.60	276.60mBC		460.00nr	327.00mk	625.00r	580.00IS		600.00	369.84	345.00#	295.00	300.00r	620.00#l	135.00	545.00	290.00F
Concrete Sewer Pipe, 12"	ft.#	1.00mKr	1.01	1.75rS	1.56S	1.30	0.85rA	1.35	1.27BD	1.05m	1.40k	1.6Sr	1.30rE	2.19DFH	0.95ilR	1.50#B	2.00#h	1.66DB	1.75i	105.00#Q	1.90ky	1.17D	1.27F
24 in.	ft.#	3.94mKr	2.75	2.75rS	3.60S	4.00	3.25rA	2.40P	2.95BD	3.50m	5.23k	4.20r	3.85fvE	6.31DFH	3.20il	3.60#B	4.30#h	3.93DB	4.05	3.30#Q	4.50ky	3.11jpD	5.19F
Copper Water Tubing																							
3/8", Type L	ft.	0.1480		0.1650	0.1420	0.1420	0.1420	0.1420		0.1680	0.1588	0.1320	0.1650	0.1620	0.1680	0.1491	0.1620	0.1441	0.1420	0.1610	0.1450	0.1491U	0.3344UV
1/2", Type L	"	0.1670		0.1840	0.1630	0.1630	0.1630	0.1630		0.1900	0.2210	0.1480	0.1880	0.1840	0.1900	0.1712	0.1840	0.1900	0.1630	0.1840	0.1656	0.1771U	0.3485UV

*r less 2% disc. 10 days. •s 1 ft lengths. •u CSA A 60. •v standard strength. •w SS; add 20% for d.s. •x fob city. •y Reinforced. •z Upper value in range based on both truck lots and less than truck lots, fob city; lower value truck lots delivered. •A single strength. •B truckload. •C less 2% disc. 15th. •D ASTM 76–57. •E less 1% disc. 10 days. •F less 2% disc. 30 days. •G LCL. •H CL. •I fob origin, freight allowed. •J reinf. B14-15. •K Less 2% disc. 15 days. •L ASTM 13–57. •M ASTM 200–57. •N 2 ft lengths. Trucklots. •O add 2% Sales Tax. •P 18 in. •Q less 1% disc. 10th. •R revised. •S ASTMC 72. 12" 1.55, 24" 4.90. •T Second price transite pipe. •U Type K. •V including 11% sales tax, less 20% in lots under 6,000 ft. •W add 3% sales tax

• Asbest. Cem. Pipe, 6" and 12" carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 125.8; Burlington, N. J., 134.6. For explanation of index see ENR Sept. 29, 1955 page 139. •b Extra strength. •c 4-in., $130. •d SS361-A. •f 21 in. •g culvert pipe; reinf., ASTM C 75–56. •h reinf., ASTM C 75–54. •i reinf., ASTM C 76–55. •j centrispun. •k less 2% disc. for cash. •l fob plant. •m truck del. •n LCL del., fob truck. •p less 5% disc. 10th. •p freight allowed to destination in city. •u 35,000# minimum.



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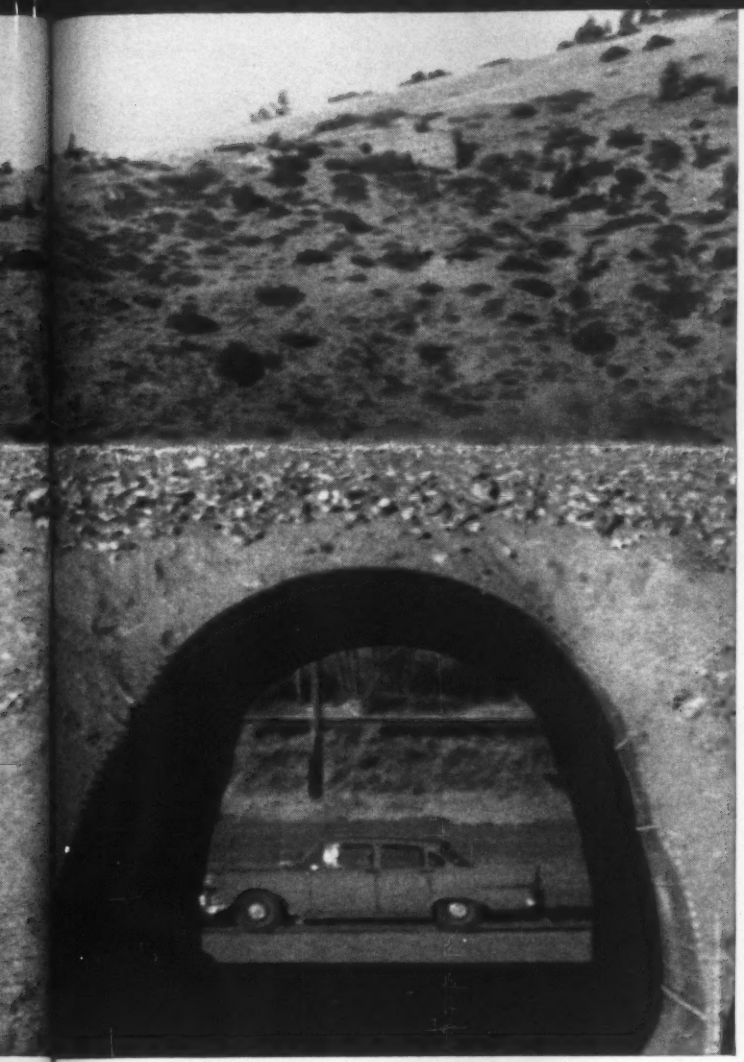
Strong, Modern, Dependable



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- ☐ Truscon Re-Bars
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City_____ Zone_____ State_____

Bids Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

BUILDINGS—BA

▲ **Mass., Cambridge**—BA 11/28—Massachusetts Institute of Technology, 77 Mass. Ave., EARTH SCIENCE CENTER, East Campus. $5,000,000. I. M. Pei & Assoc., 385 Madison Ave., New York, N. Y., archts. Ford O'Neill & Asocs., 528 King William St., San Antonio, Tex., consult. archts. Severud, Elstad, Krueger Assoc., 145 Lexington Ave., New York, N. Y., struct. engrs. Syska & Hennessey, Inc., 144 E. 39 St., New York, N. Y., mech. engr. Sasaki Walker & Assocs., 133 Mt. Auburn St., Watertown, Mass., landscape archts. Bids Mar. 1 rejected. CD 2/28/61.

BUILDINGS—LB & CA

▲ **John Capobianco,** 101 Tremont St., Boston, Mass., CA $1,875,000, Proj. U-59-4, Contr. 1, PHYSICS BLDG. ADDN., University of Massachusetts, AMHERST, MASS. Commonwealth Mass., Dpt. Educ., Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. BA 10/6. CD 10/11/61, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **N. Y., Rochester**—BA 11/28—Monroe County Water Auth., 339 East Ave., Contr. P-3 South Extension-West Side WATER TRANSMISSION MAIN. $2,000,000. Plans deposit $50. Metcalf & Eddy, Statler Bldg., Boston, Mass., engrs.

BUILDINGS—BA

▲ **N. J., Hackensack**—BA 11/21—Hackensack Hospital Assn. of Hackensack General Hospital 22 Hospital Place, 6 story, 120 bed HOSPITAL WING, Hospital Place. $3,300,000 Crow, Lewis & Wick, 200 Fifth Ave., New York, N. Y., archt. A. A. Abdalian, 468 Park Ave. South, New York 16, N. Y., struc. engr. CD 10/11/61.

▲ **N. Y., New York**—BA 11/28—Dpt. P. Wks., Municipal Bldg., Zone 7. Contr., GRADING, DRAINAGE, BULKHEAD and DEMOLITION for Bronx Terminal Market for Dpt. of Markets, Halleck St. and East Bay Ave. Over $3,500,000. Skidmore, Owings & Merrill, 425 Park Ave., archts. Madigan-Hyland, 28-04 41 Ave., Long Island City, N. Y. engrs. CD 2/29/60.

▲ **N. Y., Syracuse**—BA 11/29—Dpt. Contracts & Purchase, 318 City Hall, Northeast SENIOR HIGH SCHOOL. $3,500,000. C. W. & R. T. Clark, 625 James St., archts. Robson & Woese, Inc., 2030 Erie Blvd., East Syracuse, mech. engrs. CD 9/18/61.

BUILDINGS—SLC

▲ **N Y., White Plains**—General Foods Corp., 250 North St., soon lets contract 5 story, 190,000 sq. ft. OFFICE (North Bldg.) at north end of existing facilities. $6,000,000. Voorhees, Walker; Smith, Smith & Haines, 101 Park Ave., New York 17, N. Y., archts. CD 10/12/61.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, ROADS,

N. Y.—**Cold Springs Constr. Co.,** 3 Jackson St., Akron, N. Y., CA $1,188,680, Est. $1,526,000, 9 in. c. conc. pavt. 5.36 mi. Genesee-Porterville, SH 1322. Rte. 17, FARC 61-44. Proj. F-421(9), Allegany Co.;

N. Y.—**Arthur V. Towner, Inc.,** 1900 Clinton Ave. S., Rochester 18, N. Y., CA $710,781, est. $814,000, b. conc. 7.27 mi., repairing and painting bridge, repairing culvts. Scottsville-Mumford, SH 5046 Scottsville-Chili, SH 4279. Rte. 251 and 383 FARC 61-146, Proj. S-517(1), Monroe Co.;

N. Y.—**Economy Paving Co.,** 182 Port Watson St., Cortland, N. Y., CA $561,117, est. $730,000, b. conc. Type 1A, 9.48 mi. Vesper-Tully, SH 1070; Tully-Apulia, SH 489, Tully-Onondaga Castle Pt. 2, SH 489; Lafayette Tully SH 5516, Fabius Apulia, Pt. 3, SH 121, Fabius-Apulia, Pt. 1, SH 59, Fabius-Apulia, Pt. 2, SH 75, Fabius Rd., SH 554, Fabius Village, SH 1043. Rte. 80, 91, FARC 61-140. Proj. F-549(3), Onondaga Co.;

N. Y.—**Johnson, Drake & Piper, Inc.,** 86 Trinity Pl., New York, N. Y., CA $11,097,757, c. conc. pavt. 2.55 mi., misc. work main line viad. 40 sps. comp., I-beam 3,029 ft. 4 ramps 77 sps. comp. I-beam, 5,822 ft., 1 ramp rein.-con. slab, 22 sps. 440 ft. rein.-con. box sewer 365 ft. Van Wyck Expwy. Exten. Contr. 2, (57 Rd. to Rodman St.) Int. Rte. Conn. 514 Horace Harding Expwy. (Gr. Cent. Pkwy) Interchange to Van Wyck Expwy. Interchange Rte. 495 FAVWE 61-3 FIHHE 61-1. Proj. U-1085(21) I-495-1(49), Queens Co.;

N. Y.—**DeLillo Constr. Co., Inc.,** 94 Marine St., Farmingdale, N. Y., CA $4,281,782, est. $4,917,000, 8 in. c. conc., pavt. 3.08 mi., misc. work 0.23 mi., wid'n. 2 HGS comp. I-beam 2 sp. 163 ft. total. 4 sp. 188.3 ft. Grand Central Pkwy. Sect. 3, Contr. 3A, 172 St. to Clearview Expy., FAGCP 61-4, Proj. U-629(21), Queens Co.;

N. Y.—**Vogtli & Sons Constr. Corp.,** Broadway Rd., Gowanda, N. Y., CA $679,038, est. $807,000, b. conc. 3.56 mi., misc. work 0.16 mi., repairs to Br. No. 1, Java Center-Java Village, SH 894, Java Village-Wales SH 976A, Java Village-Wales SH 976A, Rte. 78 FARC 61-143, Wyoming Co. Grand total $18,519,155. BA 10/5 CD 10/6/61, under LB.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany,
rejected bids Oct. 5, b. conc. 1.74 mi. HGS comp. I-beam 4 sps. 251 ft. RRGS comp. I-beam 3 sps. 178 ft. 2 rein.-con. twin box culverts Maple Rd. Exten. (CR192) and sep. of grades of Maple Rd. Exten. (C 192) with powerline expressway and Lehigh Valley RR, FASS 61-10, FISS 61-11. Proj. S 250(3), Erie Co. LB $1,561,000. CD 10/6/61, under LB.

▲ **Horn Constr. Co., Inc.,** 2174 Hewlett Ave., Merrick, N. Y., LB $2,669,281, (5 bidders), reconstr. SUBWAY STRUCTURE between and constr. PLATFORM EXTENS. to Nevine St. and Atlantic Ave. Stations of Lexington Ave. and 7th Ave. Lines New York City Transit Sys., IRT Div., Contr. No. C-146, BROOKLYN, N. Y. New York City Transit Auth., Rm. 1310, 370 Jay St., New York 1, N. Y. BA 11/3. CD 10/10/61.

▲ **PENNSYLVANIA**—State Hy. Comn., 506 North Office Bldg., Harrisburg, ROAD,
New Enterprise Stone & Lime Co., Inc., New Enterprise, Pa., CA $1,883,209, 12,682 ft. constr. c conc. pavement, 25 ft. wide, 1 bridge, L.R. 55(8-15) 732 (4), 3 Twps., Huntington and Blair Counties. BA 10/13/61. CD 10/18/61, under LB.

BUILDINGS—LB & CA

▲ **Depot Constr. Corp.,** 42-15 Crescent St., Long Island City, 1, N. Y., LB $8,875,000, general contract 10 story, 218 x 218 ft. OFFICE, 1 story, bsmnt, 144 x 192 ft. BLDG. No. 8, Campus Site for Dpt. Taxation & Finance, ALBANY, N. Y. State Dpt. P. Wks., State Office Bldg., Albany, N. Y., BA 11/1/61, CD 10/4/61;
A. J. Eckert Co., Inc., 1062 Central Ave., Albany, N. Y., LB $1,927,777, heating contract for 10 story, 218 x 218 ft. OFFICE, 1 story, bsmnt, 144 x 192 ft. BLDG. No. 8, Campus Site for Dpt. Taxation & Finance, (Albany, N. Y.);
Nager Electric Co., Inc., 420 Broadway, Brooklyn 11, N. Y., LB $1,496,000, electric contract, for 10 story 218 x 218 ft. OFFICE, 1 story, bsmnt., 144 x 192 ft. BLDG. No. 8, CAMPUS SITE for Dpt. Taxation & Finance, (Albany, N. Y.);
Otis Elevator Co., 1 Columbia Pl., Albany, N. Y., LB 679,881, elevator contract for 10 story, 218 x 218 ft. OFFICE, 1 story, bsmnt, 144 x 192 ft. BLDG. No. 8, Campus Site for Dpt. Taxation & Finance (Albany, N. Y.)

▲ **Malan Constr. Co., Inc.,** 2 Park Ave., New York 16, N. Y., CA SUPERSTRUCTURE for E. F. Barrett POWER STATION, ISLAND PARK, N. Y. Long Island Lighting Co., 250 Old Country Rd., Mineola, N. Y. Eoasco Services, Inc., 2 Rector St., New York, N. Y., archt. CD 3/6/61;
J. Livingston & Co., 101 Park Ave., New York 17, N. Y., CA ELECTRICAL WORK E. F. Barrett Power Station (Island Park, N. Y.);
Brandt Corp., 50-20 25 St., Long Island City 1, N. Y., CA HEATING and PLUMBING, E. F. Barrett Power Station (Island Park, N. Y.).

▲ **Psaty & Fuhrman, Inc.,** 369 Lexington Ave., New York 17, N. Y., LB $2,194,000, 13 story NURSING SCHOOL, 130 E. 77 St., NEW YORK, N. Y. Lenox Hill Hospital, 77 St. and Park Ave., New York 21, N. Y. BA 11/2. CD 10/23/61.

▲ **S. S. Silberblatt, Inc.,** 25 W. 45 St., New York 36, N. Y., LB $9,324,000 domestic steel, LB $9,317,600 foreign steel (10 bidders) fdns. and general constr., MOTT HAVEN HOUSES, Proj. NY-5-44, E. 144 St., Willis Ave., E. 140 St., Alexander Ave. and 3 Ave., Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., Rm. 312, 299 Broadway, New York 7, N. Y. BA 11/2, CD 10/19/61;
Raisler Corp., 750 3 Ave., New York 17, N. Y., LB $1,193,200, (3 bidders), heating and ventilating MOTT HAVEN HOUSES, Bronx Boro (New York, N. Y.);
Meyerbank Elec. Co., Inc., 43-63 11 St., Long Island City 1, N. Y., LB $955,900, (5 bidders), electric work MOTT HAVEN HOUSES, Bronx Boro (New York, N. Y.);
A. Rosen & Son, 211 E. 117 St., New York 35, N. Y., LB $1,330,000, (6 bidders), plumbing, MOTT HAVEN HOUSES, Bronx Boro (New York, N. Y.)
Seaberg Elev. Co., Inc., 243 44 St., Brooklyn 32, N. Y., LB $636,538, (5 bidders), elevators, MOTT HAVEN HOUSES, Bronx Boro (New York, N. Y.).

▲ **Glenwal Co.,** Glenview Rd., Montvale, N. J., CA general contract 750 x 350 ft. and 120 x 60 ft. WAREHOUSE, Rte. 4 and Van Brunt St., ENGLEWOOD, N. J. Englewood Industrial Park, Inc., Rte. 4, Englewood, N. J. Total est. $3,000,000. Fellgraff Balou & Daly, 577 Teaneck Rd., Ridgefield Park, N. J., archts. General Motors Corp., Chevrolet Div., Detroit, Mich., lessee
Edward Hansen, Inc., 65 Railroad Ave., Ridgefield Park, N. J., CA heating and plumbing contract, WAREHOUSE (Englewood, N. J.)
John C. Morris & Sons, Inc., 206 Beacon Ave., Jersey City, N. J., CA electric contract, WAREHOUSE (Englewood, N. J.).

▲ **Samuel N. Zarpas, Construction Div. Missile Sites, Inc.,** P.O. Box 4457, Pittsburgh 5, Pa., CA $2,419,000, general constr. Hamilton-Larimer HOUSING PROJ., Proj. PA-1-11, East Liberty, PITTSBURGH, PA. Pittsburgh Housing Auth., 200 Ross St., Pittsburgh 19, Pa. BA 9/21/61. CD 10/5/61, under LB.

▲ **Polinger Brothers,** 8500 New Hampshire Ave. N. W., Wash., D. C., Owner Builds, $2,100,000, 210-unit high rise APARTMENT, Battery Lane, BETHESDA, MD. Cohen, Haft & Assoc., 7961 Eastern Ave., Silver Spring, Md., archts. CD 5/23/61.

▲ **Capital Plaza, Inc.,** c/o A. L. Aubinoe & Berry, archts., 10215 Old Georgetown Rd., Bethesda, Md., Owner Builds, $4,000,000, 300,000 sq. ft. REGIONAL SHOPPING CENTER, parking area, Defense Hy. and Washington-Baltimore Parkway, BLADENSBURG, MD. CD 4/18/61.

▲ **L. G. Meltzer Assocs.,** 1012 14 St. N. W., Wash., D. C., Owner Builds, $2,920,000, 365-unit garden type APARTMENTS, Landover Rd. and Magruder Ave., CHEVERLY, MD. Cohen, Haft & Assocs., 7961 Eastern Ave., Silver Spring, Md., archts. CD 5/23/61.

SOUTH

BUILDINGS—BA

▲ **Ky., Bowling Green**—BA 11/29—Bowling Green-Warren Co. Hospital Comn., Bowling Green-Warren County HOSPITAL ADDN. $1,500,000. Extended date. Otis & Grimes, Tyler Bldg., Louisville, Zone 2, archts. Southern Engineerfhg Co., 322 W. Jefferson St., Louisville, Zone 2, engr. CD 10/13/61.

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—State Dpt. Hys., 1221 East Broad St., Richmond, BRIDGES,

Va.—**B. F. Diamond & Co., Inc.,** Box 647, Savannah, Ga., CA $2,298,380, 5,604 lin. ft. bridge over Rappahannock River between Tappahannock and Northern Neck, 0.53 mi. approach road, Essex and Richmond Counties;

Va.—**T. A. Loving & Co.,** Wachovia Bank Bldg., Goldsboro, N. C., CA $1,274,910, twin bridges to carry interstate hy. over Rappahannock River near Fredericksburg, Interstate 95, **Spotsylvania Co.;**

Va.—**Dickerson, Inc.,** Box 448, Monroe, N. C., CA $507,359, five bridges between Rte. 1 and Rappahannock River, incl. twin spans for east and west-bound lanes Rt. 3 to overpass I-95, at interchange, single spans east for Rtes. 208, 620 and 639 to overpass the interstate, Interstate 95, Spotsylvania Co. Grand Total $4,080,649. BA 10/25/61, CD 10/27/61, under LB.

▲ **ALABAMA**—State Hy. Dpt., Montgomery, Zone 4, BRIDGES,

L. G. Wasson Coal Mining Corp., Boonville, Ind., CA $1,599,456, bridges over Coosa River east of Riverside on I-20, St. Clair and Talladega Counties, BA 9/29/61. CD 10/12/61, under LB.

▲ **ALABAMA**—State Hy. Dpt., Montgomery, Zone 4, ROADS,

Ala.—**Moss Thornton Co., Inc.,** P. O. Box 127, Leeds, Ala., CA $725,889, grading, drainage US No. 431, from point near Calhoun-Etowah County line, south toward Anniston, Calhoun Co.;

Ala.—**Flaco Corp.,** 1326 Engine St., Box 5096, Whistler, Ala., CA $1,868,576, 4 mi. road constr. located from Old Shell Road, northeast to US No. 45 in Mobile, Mobile Co. BA 9/29/61. CD 10/9/61, under LB.

▲† **Jahncke Service, Inc.,** 814 Howard Ave., New Orleans, La., CA $1,833,736, EXCAVATING HARBOR CHANNEL, Lake Ferguson, Greenville Harbar Proj. MISSISSIPPI, U. S. Eng., P. O. Box 60, Vicksburg, Miss. CD 11/11/60.

▲ **KENTUCKY and INDIANA**—Commonwealth Ky., Dpt. Hys., Frankfort, Ky., BRIDGE,

Allied Structural Steel Co., 20 N. Wacker Dr., Chicago, Ill., CA $6,825,640, bridge superstructure and lighting 0.473 mi. Over Ohio River north-south Expressway between Louisville, Ky. and Jeffersonville, Ind. I 64-9(3) 136, SP 56-798, Jefferson Co., Ky. and Floyd Co., Ind. BA 10/27. CD 11/1/61, under LB.

BUILDINGS—LB & CA

▲ **John Tester & Son, Inc.,** 1101-6th St. S.W., Clinton, Md., LB $2,696,207, (6 bidders), George Marshall HIGH SCHOOL, near Tysons Corner, FAIRFAX, VA. Fairfax Co. Bd. Educ., Fairfax, Va. BA 11/2/61. CD 10/11/61.

▲ **B. F. Diamond Constr. Co.,** P.O. Box 647, Savannah, Ga., CA Approx. $13,000,000, GENERAL CARGO TERMINAL, one 200 x 400 ft., concrete pier, concrete pile, 360,000 sq. ft. transit shed, 100,000 sq. ft. refrigerator warehouse, two 120 x 750 ft. warehouses, NORFOLK, VA. Virginia State Ports Auth., Maritime Tower, Norfolk, Va. BA 9/7/61, CA 10/31/61. CD 9/11/61, under LB.

▲ **Dunn Constr. Co.,** 2508 3rd Ave. N., Birmingham, Ala., LB $2,312,958, W. P. Davidson HIGH SCHOOL, MOBILE, ALA. Mobile Co. Bd. Educ., 504 Government St., Mobile, Ala. BA 10/31/61. CD 10/17/61.

MIDDLE WEST

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., State Depts. Bldg., Columbus, Zone 15, ROADS,

O.—**The Lathrop Co.,** 1510 Montcalm Ave., Box 772, Toledo O., CA $2,947,010, est. $3,323,100, Type T 71 and structures, 1.622 mi. USR 25, Section 0.91, SR 2, Section 18.08, I 75-6(15)201 U-498(6) (Parts Nos. 1 and 2), City of Toledo, Proj. 693, Lucas Co.;

O.—**D. E. Goodchild, Inc.,** P.O. Box 87, Circleville, O., CA $522,039, est. $578,500, Type T 35 and structure 5.913 mi. USR 22, Sections (8.36-10.23) (10.60) Village of Williamsport Deer Creek and Wayne Twps., Proj. 700, Pickaway Co. BA 10/24/61, CD 10/26/61, under LB.

▲ **S. A. Healy & Gargaro Co.,** 6561 E. 7 Mile Rd., Detroit 34, Mich., CA $3,019,965, Contr. 3, 16,600 lin. ft. 6 and 8 in. SEWERS in tunnel, Rouge Valley Sewage Disposal Sys., DETROIT, MICH. Wayne County Bd. P. Wks., Rm. 1322, City-County Bldg., Detroit 26, Mich. BA 10/17, CA 10/31. CD 10/20/61, under LB;

Chris Nelsen & Sons, Inc., 415 E. Hudson, Royal Oak, Mich., CA $1,367,660, Contr. 6, 700 lin. ft. 6 ft. 6 in. and 5 ft. 6 in. SEWERS in tunnel, 21,700 lin. ft. 6 ft. 6 in. to 5 ft. 0 in. in open cut, Rouge Valley Disposal Sys., (Detroit, Mich.).

BUILDINGS—LB & CA

▲ Knowlton Constr. Co., 1133 W. Columbus St., Bellefontaine, O., CA $1,833,822, (8 bidders), DORMITORY No. 2 and 3 Ohio University, ATHENS, O. Dpt. P. Wks., State Dept. Bldg., Columbus 15, O. BA 10/31/61. CD 9/28/61.

▲ Knowlton Constr. Co., 1133 W. Columbus St., Bellefontaina, O., LB $1,636,822, (7 bidders), South HIGH SCHOOL, MANSFIELD, O. Bd. Educ., 75 Carpenter Rd., Mansfield, O. BA 11/1/61. CD 11/18/61.

▲ Jo-Lan Constr. Co., 28499 Jackson Rd., Chagrin Falls, O., Owner Builds, $3,500,000, $1,750,000 1st year (2 year program) 180 HOMES, Friar Estates, PARMA, O.

▲ Superior Constr. Co., Inc., 2045 E. Dunes Hy., Gary, Ind., CA $1,800,000, est. $2,000,000, STUDENT CENTER and RESIDENCE HALL, RENSSELAER, IND. St. Joseph's College, Rensselaer, Ind. BA 9/26/61, CA 10/31/61. CD 8/18/61.

MISSISSIPPI TO ROCKIES

BUILDINGS—BA

▲ Tex., Huntsville — BA 12/7 — Sam Houston State Teachers College, Huntsville, 4 story WOMEN'S DORMITORY ADDN., 3 story MEN'S DORMITORY. $1,990,000. Wirtz, Calhoun, Tungate & Jackson, 2516 Richton, Houston, archts. CD 3/27/58.

BUILDINGS—SLC

▲ Mo., St. Louis—Siteman Organization, 7745 Carondelet Ave., Clayton, Zone 5, soon lets contract 16 story, 77½x173 ft. Lindell Terrace APARTMENT, incl. 2-level below grade for parking, 4501 Lindell Blvd. Over $3,000,000. Hellmuth, Obata & Kassabaum, Inc., 315 N. 10 St., St. Louis 1, Mo., archt. CD 9/8/61.

▲ Tex., Fort Worth — Duro Investments Corp., 4904 Travis, Houston, soon lets contract 7 story, 175 room, brick, tile, conc., rein.-frame, bsmnt. garage, cafe, swimming pool Tower MOTEL, 1100 blk. Lancaster St. $2,000,000. Wyatt C. Hedrick, 1200 T & P Bldg., archt.

HEAVY CONSTRUCTION—LB & CA

▲† Guy H. James Constr. Co., P.O. Box 9575, Oklahoma City, Okla., and J. H. Beckman Constr. Co., P.O. Box 846, Sioux Falls, S. C., CA $7,531,000, DAM and OUTLET STRUCTURES, Wilson Dam and Reservoir, CIVENG-23-028-62-15, KANSAS. U. S. Eng., 911 Walnut St., Kansas City, Mo. BA 10/26/61. CD 10/31/61, under LB.

▲ Spencer Constr. Co., P.O. Box 338, Carrollton, Tex., LB $2,155,519, est. $2,171,461, (5 bidders), RELOCATION State Hy. 103, McGee Bend Dam, Angelina and St. Augustine Counties, CIVENG-4-443-62-32, TEXAS. U. S. Eng., 100 West Vickery, Fort Worth, Tex. BA 11/2/61. CD 10/13/61.

BUILDINGS—LB & CA

▲ St. Louis Shipbuilding & Steel Co., 611 E. Marceau St., St. Louis, Mo., CA Est. $2,000,000, FLOATING HOTEL with 164 air-conditioned rooms, swimming pool, 2 elevators, restaurant to be moored on Mississippi River just south of Jefferson Expansion Memorial, ST. LOUIS, MO. Boatel, Inc., c/o James L. Sullivan, 4386 Lindell Blvd., St. Louis 8, Mo. Ralph A. Fournier & Assocs., 10315 Clayton Rd., St. Louis 31, Mo., archts.

▲ Catholic Diocese of Dallas & Fort Worth, 2122 Kidwell St., Dallas, Tex., contract cancelled, 1 story, 75,000 sq. ft., steel, rein.-con. Bishop Lynch Memorial HIGH SCHOOL, Peavy and Ferguson Sts., DALLAS, TEX. Project abandoned. CD 9/13/61, under CA.

FAR WEST

HEAVY CONSTRUCTION—LB & CA

▲ M & K Corp., 519 California St., San Francisco, Calif., CA $2,546,141, Camino Powerhouse PENSTOCK and APPURTENANT WORK, Upper American River Proj., El Dorado Co., Invoice No. 2230, SACRAMENTO, CALIF. Sacramento Municipal Utility Dist., 1708 59 St., Sacramento, Calif. BA 10/31. CA 11/2. CD 11/2/61, under LB.

▲ M. J. Beranda, P.O. Box 439, North Holywood, Calif., LB $2,040,381, est. $2,365,300, (9 bidders), portion INTERCEPTOR SEWER, Contr. 5, sewage, collection, treatment and disposal sys., 19 and Imperial, Harbor Dr., etc., SAN DIEGO, CALIF. City, Rm. 161, Civic Center Bldg., San Diego 1, Calif. BA 11/1, CD 10/6/61.

BUILDINGS—LB & CA

▲ A. P. Neilson, 2360 South Main, and Ben A. Davis, 1305 5 E., both Salt Lake City, Utah, CA Est. $2,000,000, A "Alben" APARTMENT for Oldsters, SALT LAKE CITY, UTAH. First Security Bank of Utah, 795 Main, Salt Lake City, Utah. David & Slack Winburn, Security Life Bldg., Salt Lake City, Utah, archts.

▲ J. D. Allen & Co., 36 East Mason St., Santa Barbara, Calif., LB $2,197,000, (7 bidders), RESIDENCE HALL, Unit 4 and DINING COMMONS NO. 2 ADDN., University of California, Goleta, SANTA BARBARA,

(Continued on page 96)

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(Continued from page 93)

CALIF. University of California at Santa Barbara, Goleta, Santa Barbara, Calif. BA 10/31, CD 10/6/61.

CANADA

BUILDINGS—BA

▲ **Ont., Toronto**—BA 11/21—Massey Foundation, c/o University of Toronto, Simcoe Hall, 3 story, approx. 80,000 sq. ft. brick GRADUATES RESIDENTIAL COLLEGE, Devonshire Place and Hosking Ave. $1,750,000. Thompson, Berwick & Pratt, 1553 Robson St., Vancouver, B. C., archts. Hancock, Little, Calvert Assocs., 40 Irwin Ave., assoc. archts. CD 10/26/61.

▲ **Ont., Oakville**—BA 1/2—Shell Oil Co. of Canada Ltd., 505 University Ave., Toronto, PROCESSING FACILITIES, at REFINERY, incl. equipment for distillation, vacuum flashing, catalytic cracking, reforming, alyklation, hydrodesulphurization plus treating, blending, water cooling, steam generation. Over $2,000,000.

BUILDINGS—LB & CA

▲ **Reich Bros. Constr. Co., Ltd.**, Chomedy, Que., Owner Builds, $5,000,000, Riverside Park HOUSING, 12,000 sq. ft. SHOPPING AREA, Levesque Blvd., CHOMEDY, QUE.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲ **Hitachi Ltd.**, Tokyo, Japan and 501 5 Ave., New York, N. Y., U.S.A., CA four 214,000 FRANCES TURBINE GENERATORS, Volta Proj., GHANA. Govt. Ghana, Accra, Ghana. BA 9/5. CD 5/25/61.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **Nicaragua**—BA 3/1—Empresa Nacional de Luz y Fuerza Managua, First Stage TMV HYDROELECTRIC SYS. Centroamerica Proj., Rio Cacao Power Plant, 5 kilometres NW of Jinotega, Jinotega Dpt., incl. (a) power canal, 3,8 km long, 550,000 m3 earth excav. (b) intake 14,500 m3 excav., 2,000 m3 concrete, 40 tons reinforcing steel (c) power tunnel and surge tanks; 3 km. 3.00 I.D. tunnel, 40,000 m3 rock excav., 11,000 m3 concrete, 400 tons reinforcing steel (d) valve house and penstock (civil works) 15,000 m3 excav., 5,000 m3 concrete, 150 tons reinforcing steel (e) powerhouse and substation (civil works) pit-type for two 25,000 kw units, 2,000 m3 excav., 7,000 m3 concrete, 500 tons reinforcing steel (f) tailrace tunnel and stilling basin (g) misc. work incl. 110 m2 storehouse, 500 m acc. road, powerhouse water and sewerage sys. Copies of Contract Documents, incl. specification and drawings may be obtained after December 1, from Empresa Nacional de Luz y Fuerza, Gerencia de Construccion, Managua, upon payment of 700 Cordobas for first set, and 210 Cordobas for each addnl. set, and from Electronsult Consulting Engineers, Via Cavallotti 13, Milan, Italy upon payment of $100 US dollars for first set and $30 US dollars for each addnl. set; adv. ENR 11/16. CD 6/2/61.

FOREIGN

HEAVY CONSTRUCTION—LB & CA

▲ **Foster Wheeler Ltd.**, London, England, (subsidiary Foster Wheeler Corp., 666 5 Ave., New York, N. Y., U.S.A.), CA $8,400,000, 14,300 bb. per day CRUDE DISTILLATION UNIT at Refinery, SYRIA, BURMA. Burma Oil Co., 604 Merchant St., Rangoon, Burma. CD 12/20/60.

For additional reports see CONSTRUCTION DAILY REPORTS SECTION

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **Ill., Alton**—City, City Hall, voted $1,625,000 bonds Oct. 24, SEWAGE TREATMENT PLANT, $820,000, INTERCEPTOR SEWERS, incl. Plaza Valley Sewer, Upper Alton Sewer Imprvs., Broadway, Alton Plaza, The Milton Area and Shields Valley, $7,500,000. Shepard, Morgan & Schwab 10 E. Broadway, consult. engrs. CD 8/23/61.

▲ **Mass., Chicopee**—City, City Engineer's Office, City Hall, SEWAGE DISPOSAL PLANT, two sections. $3,000,000. Tighe & Bond, Inc., Bowers and Pequot Sts., Holyoke, Mass., consult. engr. Bids early 1962. CD 5/2/60.

▲† **Mass., Holyoke**—City, P. Wks. Dpt., City Hall, SEWAGE TREATMENT PLANT. $2,497,000. Tighe & Bond, Inc., Bowers and Pequot Sts., consult. engr. Bids 1962. CD 5/1/57.

▲ **Okla., Oklahoma City**—City, City Hall, voted bonds Oct. 24, SANITARY SEWER IMPRVS., STORM SEWER IMPRVS., $14,000,000. W. W. Baker, City Hall, engr. BA 1962. CD 9/7/61.

BRIDGES

▲ **WASHINGTON**—State Hy. Comn., Transportation Bldg., Olympia, BRIDGE,
Snohomish Co.—second trestle, Primary State Hy. 15, Everett to Cavalero's Corner to parallel existing trestle, $6,700,000.

STREETS AND ROADS

▲ **OHIO**—State Hy. Dpt., State Depts. Bldg., Columbus, Zone 15, ROAD,
Clark Co.—Interstate 70 around Springfield, $11,860,000. Shaffer, Parrett & Assocs., 672 Logan Rd., Mansfield, consult. engrs.

(Continued on page 107)

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Famous names

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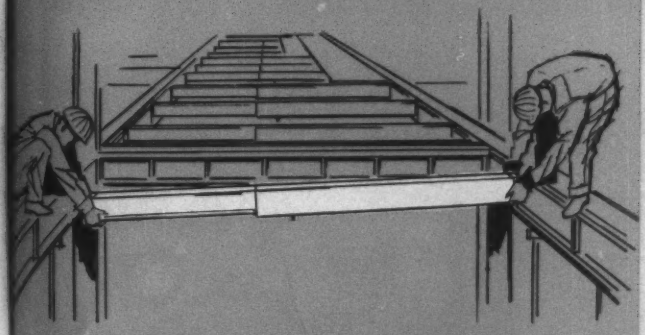

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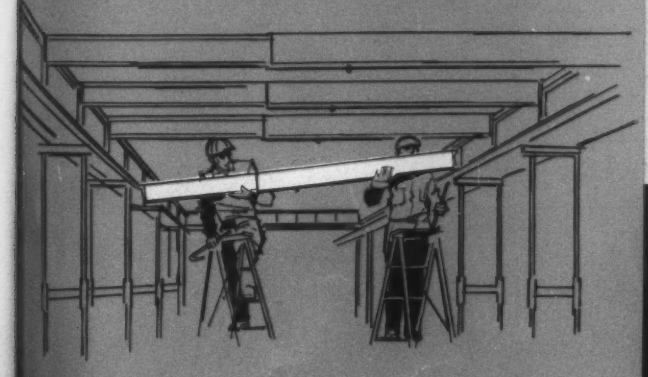


Lightweight ALCOA * HICO BEAMS **REDUCE STRIPPING TIME**

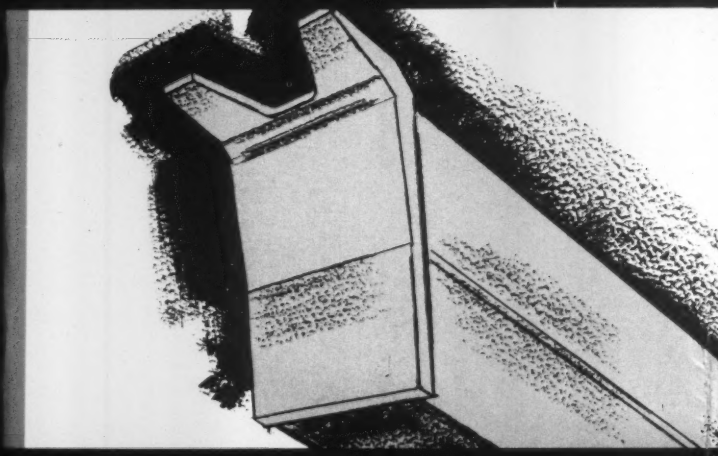
now combined

save you money on shoring!

WITH NEW LIGHTWEIGHT ALUMINUM ALCOA®* HĪCO® SHORING BEAMS†

Lighter than steel with Higher Safety Factor

†Patents Pending



*HICO®

This new lightweight ALCOA * HICO aluminum shoring beam is the most important time-and-money-saving development offered the construction industry in years.

Now contractors responsible for the construction of reinforced concrete or precast block floors can rent ALCOA * HICO shoring beams and save money through reduced handling time, reduced erection time and reduced stripping time.

Made of special high strength structural aluminum alloy, ALCOA * HICO beams are 30% lighter in weight than conventional steel shoring beams yet offer a higher safety factor.

Before you plan your next job check all the money-and-time-saving advantages ALCOA * HICO shoring beams offer you—then mail the post card below for complete information.

- **ALCOA * HICO beams are easily adjusted to fit any required clear span from 6 ft. to 21 ft. Adjustment of locking device can be accomplished without special tools.**

HICO Corp. of America
— Aluminum Division

Gentlemen:
Please rush complete information on ALCOA * HICO shoring beams.
We are planning a building involving (approx.) _____ sq. ft. of concrete flooring, with construction to begin on or about_____.

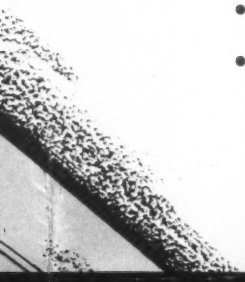
Name of Individual_____

Name of Contractor_____

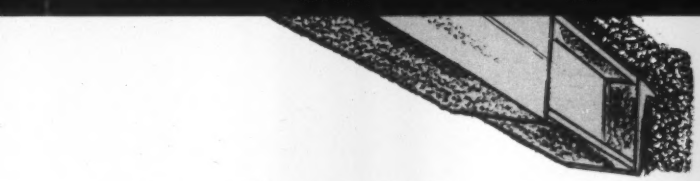
Address_____

City_____ State_____

- SAFETY FACTOR (minimum) EQUALS 2.5
- BUILT-IN CAMBER
- 6 FT. TO 21 FT.



adjustable horizontal shoring beams



- Light in weight—Example: a 9'—15' beam weighs only 67 lbs. or 4.5 lbs. per ft. when fully extended—can be readily carried by one man—easily installed by two men.
- High strength alloy is resistant to field damage or disfiguration from hard usage or normal abuse. Has greater resiliency than steel.
- No special tools or skilled labor required.
- High safety factor—Minimum 2.5 to 1 compares with 2.0 to 1 for steel beams.
- Built-in camber (proportionate to length of beam) never needs adjustment—insures uniformity.
- Labor saving—easy-to-handle, lightweight beams reduce installation time. Beams go in place faster—less fatigue for workers.
- Tapered end supports assure easy stripping.
- No loose parts—Nothing to lose.
- Rust resistant aluminum never needs protective painting or costly maintenance. Strips cleaner and faster.
- More resilient than steel.
- Manufactured by world's largest aluminum producer—your assurance of dependable performance.
- No investment—nothing to buy—you rent for duration of concrete pouring time only. No equipment standing idle between jobs.

FOR DETAILED INFORMATION CUT OUT AND MAIL THIS REPLY POST CARD TODAY!

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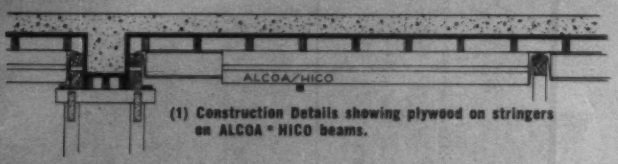
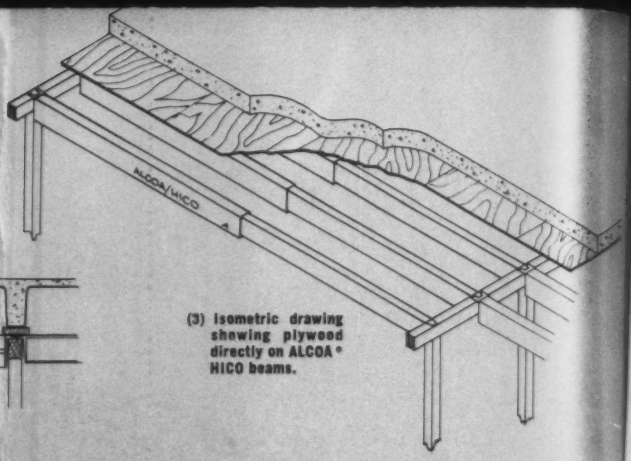


(1) Construction Details showing plywood on stringers on ALCOA * HICO beams.

(2) Construction Details showing pan slab construction.



(3) Isometric drawing showing plywood directly on ALCOA * HICO beams.

carrying capacity for ALCOA*HICO SHORING BEAMS

STANDARD SIZE BEAMS:

6' — 10'6"
9' — 15'
11' — 17'

Combinations of standard sizes available to cover spans from 6' to 21'.

Thickness of Slab	Weight per sq ft	Total wt. incl. L.L.† Forms	Spacing 16"	Spacing 20"	Spacing 24"	Spacing 28"	Spacing 32"	Spacing 36"	Spacing 40"	Spacing 44"	Spacing 48"
4	50	90		20'7"	18'10"	17'5"	16'4"	15'4"	14'7"	13'11"	13'4"
4½	56	96		20'0"	18'3"	16'10"	15'9"	14'11"	14'1"	13'6"	12'11"
5	62	102		19'4"	17'8"	16'4"	15'4"	14'5"	13'8"	13'1"	12'6"
5½	69	109	21'0"	18'9"	17'1"	15'10"	14'10"	14'0"	13'3"	12'8"	12'1"
6	75	115	20'6"	18'3"	16'8"	15'5"	14'5"	13'7"	12'11"	12'4"	11'9"
6½	81	121	19'11"	17'9"	16'3"	15'0"	14'1"	13'3"	12'7"	12'0"	11'6"
7	88	128	19'4"	17'4"	15'10"	14'7"	13'8"	12'11"	12'3"	11'8"	11'2"
7½	94	134	18'11"	16'11"	15'5"	14'3"	13'4"	12'7"	12'0"	11'5"	10'11"
8	100	140	18'6"	16'6"	15'1"	13'11"	13'1"	12'4"	11'8"	11'2"	10'5"
8½	106	146	18'1"	16'2"	14'9"	13'8"	12'10"	12'1"	11'5"	10'11"	10'3"
9	112	152	17'9"	15'10"	14'6"	13'5"	12'6"	11'10"	11'3"	10'8"	10'0"
9½	118	158	17'5"	15'6"	14'2"	13'2"	12'4"	11'7"	11'0"	10'4"	9'6"
10	125	165	17'0"	15'3"	13'11"	12'10"	12'0"	11'4"	10'9"	10'0"	9'2"
10½	131	171	16'9"	14'11"	13'7"	12'8"	11'9"	11'2"	10'6"	9'7"	
11	138	178	16'5"	14'8"	13'4"	12'5"	11'7"	10'11"	10'3"	9'2"	
11½	144	184	16'1"	14'5"	13'2"	12'2"	11'5"	10'9"	10'0"		
12	150	190	15'10"	14'2"	12'11"	12'0"	11'2"	10'6"	9'6"		

†Live Load—40 lbs per sq foot

Bending Moment—8000 Ft lbs End Reaction—3000 lbs

plywood loading chart

PLYWOOD SIZE	½"	⅝"	¾"
SUPPORT SPACING	Uniformly Distributed Loading lbs/sq ft		
12"	480	890	1120
14"	310	560	820
16"	210	380	560
18"	150	270	400
19"	130	230	350
20"	120	200	300
22"	90	150	240
24"	70	120	180
26"	—	100	150
28"	—	80	110
30"	—	65	80
32"	—	53	69

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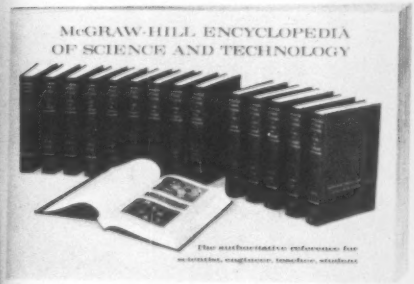

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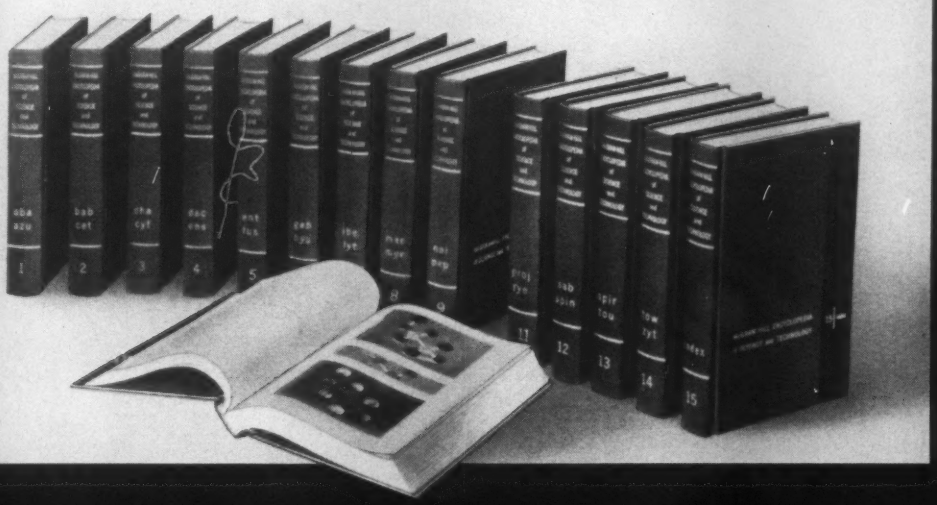
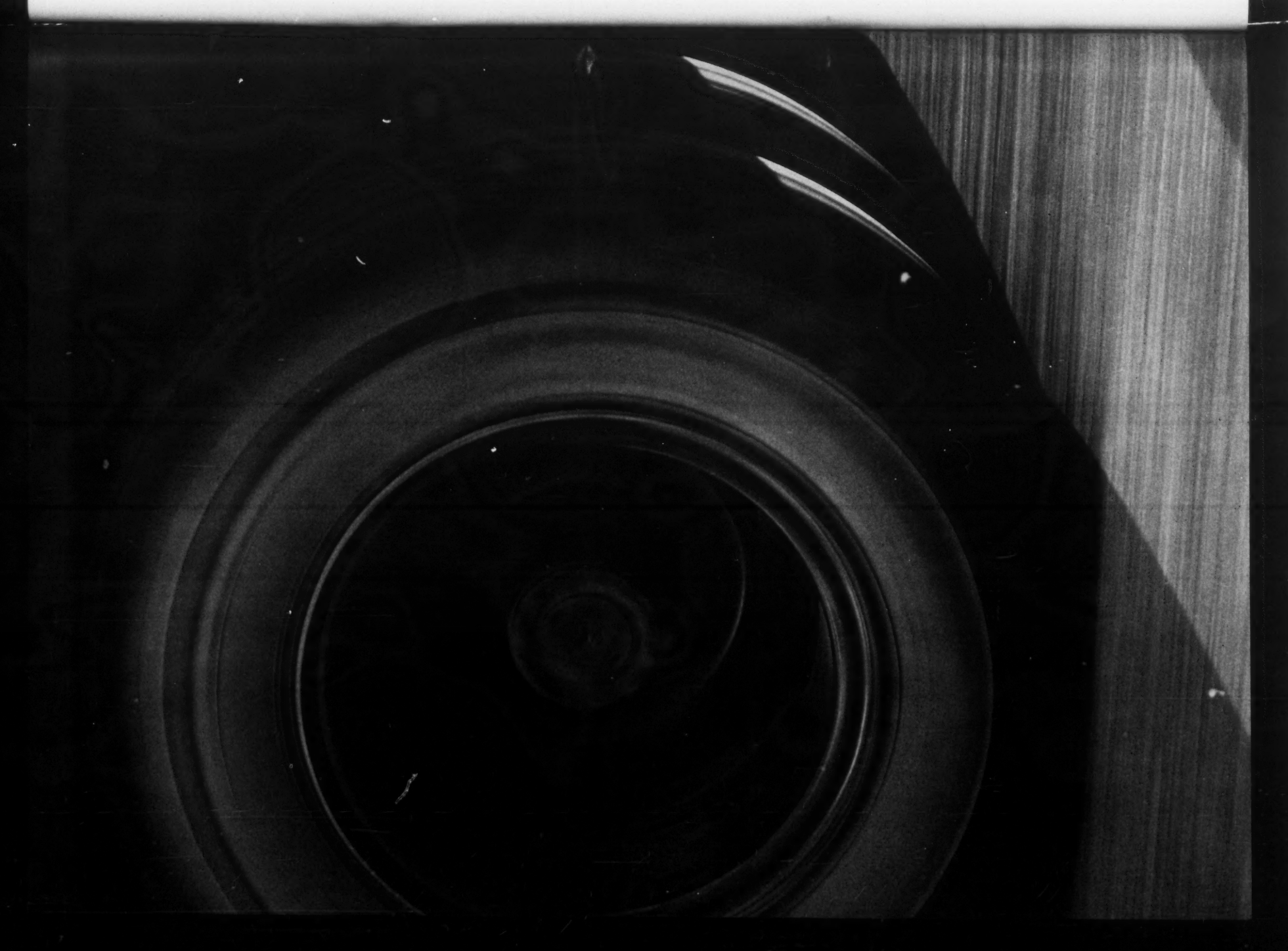


New from McGRAW-HILL

If you find yourself among the growing number of science and engineering specialists unable to keep up with the explosive pace of developments today, you will see a valuable solution at the top of this page.



THE STUFF THAT WHEELS ARE TURNED BY

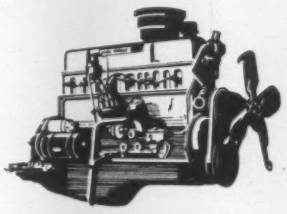
The accent's on torque in a big way for '62, in Chevy's new High Torque power lineup for medium- and heavy-duty trucks. New features, new performance characteristics, and even two brand-new extra-displacement V8's are tailored throughout the line to deliver a heaping hoodful of bulling, bruising torque—to dig in and move out under full capacity loads without a fuss. You'll find Chevy's brand of performance gives you a new kind of mastery over the toughest jobs you tackle, with brute-force breakaway power that just won't take no for an answer. There's no such thing as "no can do" when you're powered up the Chevy High Torque way!

High Torque 261 Six—Standard in Series 60 and 60-H models (GVW's up to 23,000 lbs.). Ideal for hauls that call for load-lugging High Torque power *plus* proved 6-cylinder economy. Delivers 235 ft.-lbs. of torque and 150 hp to handle maximum loads with low-cost efficiency. This engine backs up your bank account with brute strength to spare—with a forged steel crankshaft, high-alloy inlet valves, hard-faced exhaust valves with Roto-coils and much more.

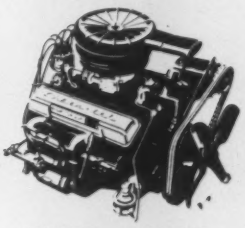
High Torque 327 V8—Optional at extra cost in Series 60 and 60-H (GVW's up to 23,000 lbs.). It's Chevy's newest and biggest medium-duty engine, ready to turn to with 305 ft.-lbs. of hard-pulling torque and 185 hp to tame your toughest jobs. Efficiency stays up, operating costs stay *low* with top-quality features like these: fuel-metering Power-Jet carburetor, durable precision bearings, aluminized inlet valves, hard-faced exhaust valves and full-flow oil filter.

High Torque 348 V8—Standard in Series 80 models (18,500- to 25,000-lb. GVW range). Provides 220 hp and 325 ft.-lbs. of torque to keep big loads moving at lowest cost. Comes equipped with scores of heavy-duty design features such as inside/outside carburetor air system that helps stabilize air supply temperature, highest quality valves and bearings, precision-engineered lubrication, cooling and ventilation systems. This one assures years of low maintenance, high mileage operation.

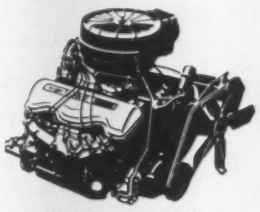
High Torque 409 V8—Optional in Series 80 models (18,500- to 25,000-lb. GVW range). It's the biggest, *pullingest* engine that ever powered a Chevy heavyweight. With a whopping 252 hp and 390 ft.-lbs. of torque, the High Torque 409 V8 is made to order for *extra* rugged runs. Long life and trouble-free performance are sure things, thanks to such special heavy-duty features as induction-hardened valve seats, forged steel crankshaft, new 4-barrel carburetor, to mention just a few. (For *all* the details on High Torque power for your job, see your Chevy dealer.) . . . Chevrolet Division of General Motors, Detroit 2, Michigan.



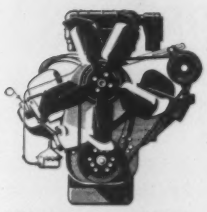
High Torque 261 Six



High Torque 327 V8



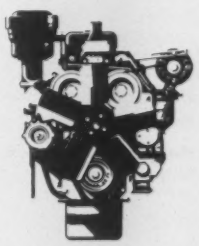
High Torque 348 V8

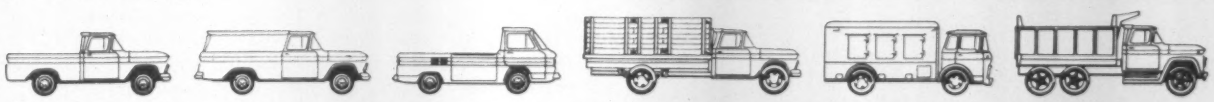


High Torque 409 V8

PLUS NEW GENERAL MOTORS SERIES 53 DIESELS

For '62 Chevrolet introduces new GM Diesels for medium- and heavy-duty trucks! Specially designed for lowest cost performance in Series D60 and D60-H (15,000 to 23,000 GVW) is the proved 130-hp GM 4-53 Diesel. And, for haulers who work in the Chevy Series 80 range (18,500 to 25,000 lbs.), the new 195-hp GM 6V-53 Diesel will be available soon. If you work your trucks near the limit with heavy loads, high mileages, severe stop and go or excessive idling, you're in for a pleasant shock when you find out how much a Chevy Diesel can save you!

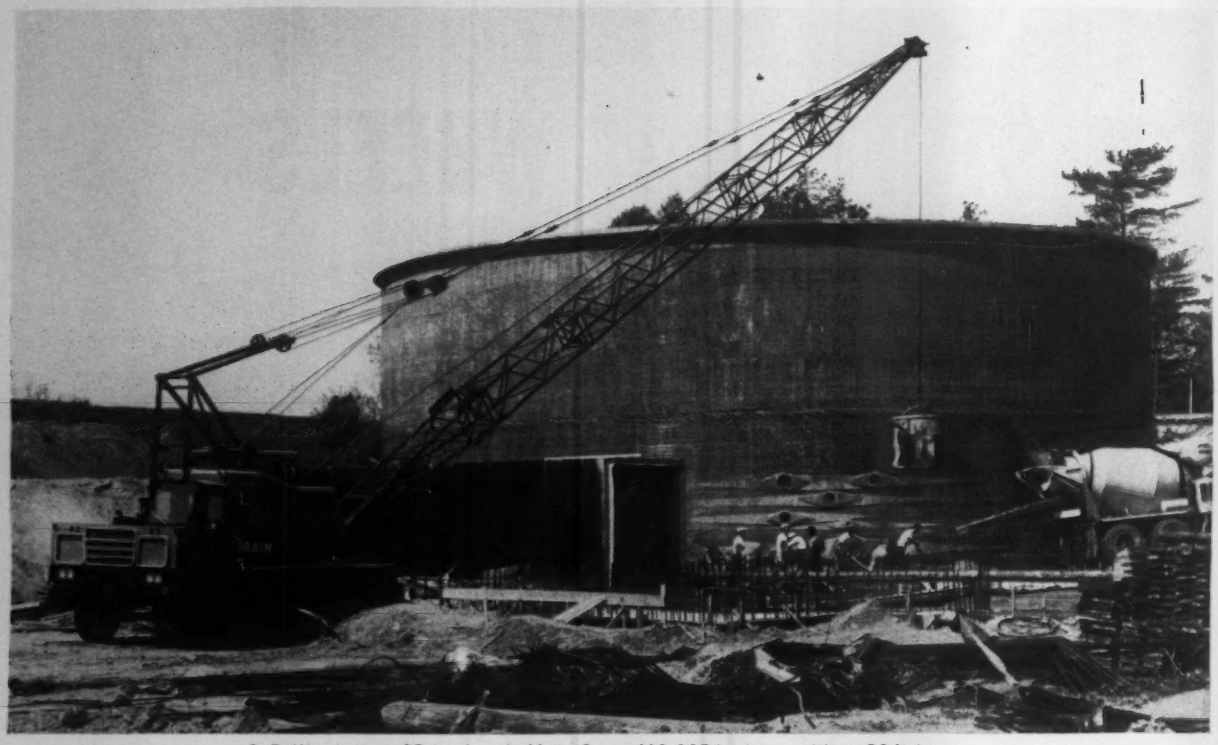




built to keep running and running and running and running and running and running and running and running

1962 CHEVROLET JOBMASTER TRUCKS

CHEVROLET



C. P. Ward's new 25-ton Lorain Moto-Crane MC-325 is shown with an 80 ft. boom pouring concrete for the new Durand-Eastman disposal plant in Rochester.

HERE IS WHY AN 11-TIME LORAIN OWNER BOUGHT A NEW 25-TON LORAIN MOTO-CRANE MC-325

Buying 11 machines of the same make is in itself an endorsement of their performance—but C. P. Ward, Rochester, New York, has learned to expect more from each succeeding Lorain he buys because of Lorain's constant improvements and their additional features. Take his new "MC-325" for instance—here are some of the new items he got that are now busy making him money—

Power-Set® outriggers are now standard on Lorain 25-ton machines. All four outriggers set in about a minute . . . move-ups are even faster.

Shear-Ball® turntable connection provides smoother "ball-bearing" swings—ends adjustment, maintenance, and lubrication problems. 10-year warranty.

Full-circle cab visibility. Picture window design with 360° visibility from operator's position. Walk-thru accessibility.

Removable counterweight, outrigger boxes and beams for highway weight reduction.

Power-operated back-hitch gantry. Controlled from operator's position for maximum capacities or minimum headroom.

New turntable design, all-welded bed and A-frame of heavy steel plate for true shaft alignment.

Square-Tubular-Chord boom, lighter weight, stronger, longer. Pin-connected for ease of assembly.

Lorain-built carrier has twist-free, all-welded, box section frame, 15 speeds forward, and a 47-mph highway speed.

Your nearest Lorain distributor can tell you more about all these features—and can add to this list. Call on him today!

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN®

DOES MORE FASTER—FOR LESS

PLANTS in Lorain and Elyria, Ohio.

PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawler from ⅜- to 2½-yard capacity · Cranes from 7 to 80 tons . . . on crawlers, and as rubber tire Moto-Cranes, and Self-Propelled Cranes · Rubber tire front-end Moto-Loaders in 6,000-lb., 7,000-lb., and 9,000-lb. operating capacities.

OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

(Continued from page 96)

▲ Okla., Oklahoma City—City, City Hall, voted bonds Oct. 24, STREET IMPRVS. $8,900,000. W. W. Baker, City Hall, engr. BA 1962. CD 8/22/61.

EARTHWORK, WATERWAYS

▲ Tex., San Antonio—San Antonio River Authority, 342 West Woodlawn Ave., SAN ANTONIO RIVER FLOOD CONTROL, Bexar, Karnes, Goliad and Wilson Counties. $3,500,000 (three year program).

AIRPORTS

▲ Calif., Sacramento—Bd. Supervs., Sacramento Co. Admin. Bldg., 827 7 St., 2,200 acre AIRPORT, Natomas District. $12,500,000. Bids 1962-1963.

▲† Mississippi—U. S. Eng., Box 1169, Mobile, Ala., STATIC TEST FACILITY, incl. six concrete test pads for Saturn Proj., Hancock and Pearl Counties, for National Aeronautics and Space Administration. $13,500,000 appropriated (including site purchase). Total $40,000,000.

▲ Okla., Oklahoma City—City, City Hall, voted bonds Oct. 24, AIRPORT IMPRVS. $5,000,000. W. W. Baker, City Hall, engr. BA 1962. CD 8/22/61.

▲† Va., Chantilly—Federal Aviation Agency, 16th St. and Constitution Ave., Wash., D. C., JET APRON OPERATIONS BLDG., UTILITIES, TAXIWAY and APRON EXTENSIONS, MAINTENANCE SHOP, AIR CARGO and WAREHOUSE, Dulles International Airport. $20,000,000 (appropriated).

UNCLASSIFIED

▲ Okla., Oklahoma City—City, City Hall, voted bonds Oct. 24, PARK IMPRVS. $5,250,000. W. W. Baker, City Hall, engr. BA 1962. CD 8/22/61.

▲ Ont., Hamilton—Hamilton Harbor Comn., 605 James St. N, TERMINAL EXPANSION, incl. three sheds, 300,000 sq. ft. cargo space for shipping dock. $5,000,000. CD 5/17/55.

PUBLIC BUILDINGS

▲ Ala., Montgomery—State Building Comn. State Office Bldg., plans by Charles H. McCauley, 1917 5th Ave. S., Birmingham, OFFICE, $3,500,000. CD 12/12/60.

▲ Calif., Modesto—Modesto High School Dist., plans by Bomberger & Abst, P.O. Box 3026, HIGH SCHOOL. $3,300,000 bonds voted Oct. 17.

▲ Calif., Newark—Newark Elem. School Dist., 6135 Thornton Ave., voted $3,750,000 bonds Oct. 24, SCHOOLS. CD 9/27/61.

▲ Calif., Santa Barbara—Santa Barbara City Bd. Educ., 1235 Chapala St., plans by Daniel, Mann, Johnson & Mendenhall, 3325 Wilshire Blvd., Los Angeles, Phase I, Santa Barbara City COLLEGE EXPANSION, La Playa Field, library, student Center, science and math laboratories. $3,455,000.

▲ Colo., Greely—Greeley School Bd., City Hall, $6,380,000 bond election Dec. 12, HIGH SCHOOL, JUNIOR HIGH SCHOOL, six ELEMENTARY SCHOOLS, two ADDITIONS to present ELEMENTARY SCHOOLS, John Shaver & Assocs., 205½ S. Santa Fe, Salina, Kan., archts. CD 10/30/56.

▲ Colo., Westminster—Adams County School Dist. No. 50, Westminster, $3,500,000 bond election Dec. 19, SCHOOL.

▲ Del., Newark—University of Delaware, Newark, plans by Howell, Lewis Shay & Assocs., 15th and Chestnut Sts., Phila., Pa., 5 RESIDENCES HALLS, DINNING HALL, $2,500,000. Keast & Hood, 1201 Chestnut St., Phila. Pa., consult. engrs. CD 9/11/61.

▲ Ill., Waukegan—Bd. Comrs. Lake Co., Courthouse plans by Ganster & Henninghausen, 222 Washington St., COURTHOUSE, $6,615,000. CD 11/1/61.

▲ La., Gretna—Jefferson Parish Council, City Hall, 200-bed HOSPITAL, East Bank in Bissonet Plaza, New Orleans Area. $4,000,000. Bids 1962.

▲ Md., College Park—State, Dpt. P. Imprvts., 301 W. Preston St., Baltimore, plans by Hopkins, Pfeiffer & Assoc., 10 E. Mulberry St., Baltimore, Zone 2, Colonial Type air-conditioned ARTS and SCIENCES CLASSROOM, incl. 1500-seat auditorium. $2,750,000. Bids 1962. CD 8/14/61.

▲† Mich., Detroit—U. S. Eng., P. O. Box 1027, Detroit, Zone 31, plans by H. E. Beyster & Assocs., 9152 Woodward Ave., Zone 2, HEADQUARTERS BLDG., Army Ordnance Tank-Automotive Command, Detroit Arsenal. $5,000,000. CD 9/5/58.

▲ Mich., Fraser—Bd. Educ., 3210 Caroline Ave., bond election Feb. 24, JUNIOR HIGH SCHOOL and ELEMENTARY SCHOOLS ADDNS. $4,400,000.

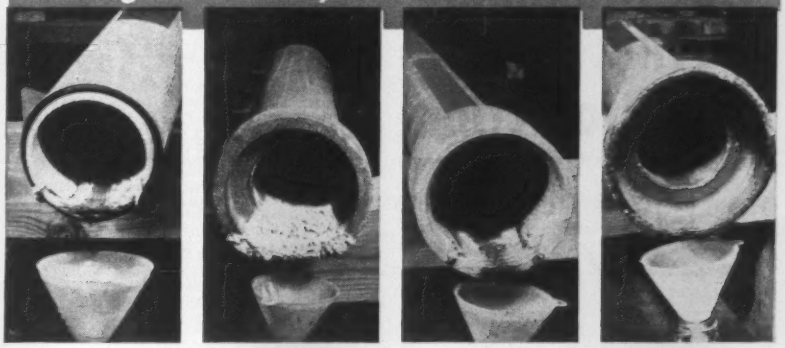
▲ N. J., Secaucus—Bd. Freeholders Hudson Co., 595 Newark Ave., Jersey City, 200-bed GERIATRIC HOSPITAL; 500-bed WELFARE HOME. $10,800,000. To go ahead 1962.

▲ N. Y., New York—New York City Housing Auth., 299 Broadway, New York Zone 7, plans by Ballard, Todd & Snibbe, 123 E. 77 St., New York, Zone 21, Proj. NY-5-62, seven 30 story, 1,700 unit low-rent APARTMENTS, Polo Grounds Site, 17 acres Highbridge Park, Colonial Park Houses, W. 155 St. and Eighth Ave., $29,750,000. Joseph Loring Assocs., 25 W. 45 St., New York, Zone 36, mech. engrs. Fraioli-Blum-Yesselman, 250 E. 43 St., New York, Zone 17, struct. engrs. Clarke & Rapuano, 830 3 Ave., New York, Zone 22, landscape archts. CD 9/14/61.

▲ N. Y., Wilton—State Dpt. P. Wks., State Office Bldg., Albany, SCHOOL of Mentally Retarded, medical-surgical hospital, residences, cottages, training bldgs.,

only CLAY meets the ACID TEST!

Unretouched* photos show corrosion damage caused by the flow of acid solution.



CEMENT-ASBESTOS | CONCRETE | CEMENT-ASBESTOS FOREIGN | CLAY

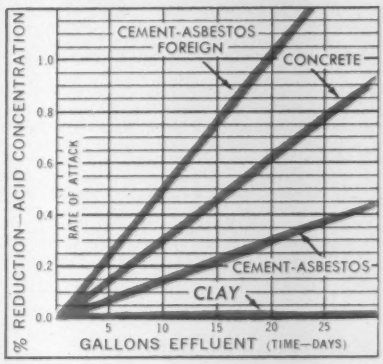
*Manufacturers' brand names deleted.

It's sulphuric acid that destroys sewer lines made of materials bought as substitutes for lifetime Vitrified Clay Pipe. And sulphuric acid—which combines chemically with the binding material in other products to disintegrate them—can't hurt Vitrified Clay, a completely inert material.

Special tests at the Clay Pipe Industry's modern laboratory at Crystal Lake, Illinois, recently illustrated just how damaging this acid concentration can be.

As you can see in these photographs and the chart, the acid started eating up the substitute materials quickly. But it didn't do a thing to lifetime Vitrified Clay.

It's a simple test. Try it yourself before you specify any product for your sanitary sewers other than Vitrified Clay. We just pumped 30 gallons of 8.6 percent sulphuric acid by weight through four different pipe specimens



—in this case, domestic cement-asbestos, concrete, foreign cement-asbestos and clay.

Remember, you can't argue with the facts, and you can't repeal the laws of science. Sewer gas and oxygen are present in all sanitary sewers. And sewer gas and oxygen combined add up to sulphuric acid, which destroys substitutes for Vitrified Clay Pipe.

NATIONAL CLAY PIPE MANUFACTURERS, INC.
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Please send me full details on the results of the acid tests on the four sewer pipe materials shown here.

(name)

(company)

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B-6C23 EN

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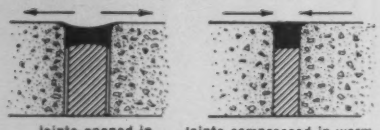

Joints opened in sub-zero temperatures

Joints compressed in warm weather temperatures

Hot-Poured Para-Plastic is an effective joint sealer consisting of a rubberized asphalt compound that forms a tough, resilient, adhesive, and waterproof seal, which will maintain bond at sub-zero temperatures. Para-Plastic is unaffected by temperature extremes and insures a moisture-tight seal of expansion, contraction and dummy joints in concrete pavement of all types. Millions of pounds of Para-Plastic have been installed on Air Force, Navy and civilian air fields, State Highways and similar projects.

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play field, Rte. 9. $17,000,000. Carl W. Larsen, state archt.

▲ **O., Newark**—Licking County Hospital Comn., c/o County Comrs., Courthouse, 220-bed HOSPITAL, $5,500,000.

▲ **Okla., Muskogee**—Bd. Educ., Muskogee, plans by Zaroov & Davis, Muskogee, CENTRAL HIGH SCHOOL, $3,000,000. Bids 1962.

▲ **Tex., Garland**—City, City Hall, steam-generating ELECTRIC POWER PLANT. $5,500,000. CD 10/3/58.

▲ **Tex., Spring Branch**—Spring Branch Ind. School Dist., 9000 Westview St., bond election Dec. 9,
JUNIOR HIGH SCHHOOL, $2,200,000.
SENIOR HIGH SCHOOL, $3,200,000.
ELEMENTARY SCHOOL No. 1, $700,000.
ELEMENTARY SCHOOL No. 2, $700,000.
ELEMENTARY SCHOOL No. 3, $650,000.
ELEMENTARY SCHOOL ADDN. $900,000.
JUNIOR-SENIOR HIGH SCHOOL ADDNS., $850,000. CD 11/30/59.

▲ **Va., Winchester**—Winchester Memorial Hospital, Winchester, plans by Baskervil & Son, 2313 West Cary, Richmond, 130-bed HOSPITAL. $2,700,000. CD 10/25/61.

▲ **Ont., Hamilton**—City, City Hall, plans by William R. Souter & Assocs., 36 James St. S., Nora Frances Henderson HOSPITAL ADDN., Concession St. $8,-135,000. C. C. Parker & Assocs., Ltd., 795 Main St. W., consult. engrs. CD 3/3/61.

▲ **Sask., Saskatoon**—Saskatoon School Dist., TRADE and TECHNICAL SCHOOL, $2,500,000.

COMMERCIAL BUILDINGS

▲ **Ark., Fort Smith**—Sparks Memorial Hospital, Fort Smith, plans by E. Chester Nelson & Assocs., Merchants National Bank Bldg., 6 story HOSPITAL ADDN. $2,-500,000. Bids January 1963.

▲ **Colo., Denver**—St. Anthony's Hospital, West 16th and Quitman, plans by Monnot & Monnot, 30131/2 Classen Blvd., Oklahoma City, Okla., 225-bed west wing addn. to St. Anthony's HOSPITAL. Approx. $3,000,000.

▲ **Hawaii, Waipahu**—Hawaiian Dredging & Constr. and Oahu Railway & Land Co., 1350 Ala Moana Blvd., Honolulu, plans by John Graham & Co., 1350 Ala Moana Blvd., Honolulu, Hawaii, Four Phases, 652,200 sq. ft. Waipahua REGIONAL SHOPPING CENTER, incl. 4800-car parking. $10,000,000. Bids April 1962.

▲ **Ill., Mundelein**—Catholic Bishop of Chicago, 719 N. Wabash Ave., Chicago, CARMEL HIGH SCHOOL, RTE. 176. $2,500,000. BA 1/62.

▲ **Ind., Hammond**—Bishop Noll High School, 1519 Hoffman St., plans by Bachman & Bertram, 5116 Hohman St., HIGH SCHOOL ADDN. $3,000,000. Bids late 1961.

▲ **Mass., Boston**—Harvard Medical School, 24 Shattuck St., plans by Hugh S. Stubbins & Assoc., 806 Mass. Ave., Cambridge, Francis A. Countway LIBRARY of MEDICINE. $5,000,000. Bids early 1962. CD 1/7/60.

▲ **Mass., Hyannis**—All Cape Business Sales, Inc., 337 Main St., plans by Michael D. Schwartz & Assocs., 114 E. 32 St., New York, N. Y., Picture Pond Plaza SHOPPING CENTER between Rtes. 28 and 132. $3,-600,000. Bids early 1962.

▲ **Minn., Shoreview (P.O. St. Paul 12)**—R. Kroiss Constr. Co., 2839 Woodbridge St., Roseville, seven or eight 1 story 500-elderly NURSING HOME. $2,500,000.

▲ **N. J., Long Branch**—Monmouth Medical Center, 300 Second Ave., plans by Ferrenz & Taylor, 1451 Broadway, New York, N. Y., HOSPITAL ADDN., $2,000,-000, CD 9/15/61; plans by Wm. Chirgotis, 80 Morris Ave., Springfield, 100-garden APARTMENTS for hospital staff, Dunbar Ave., $500,000.

▲ **N. Y., Elmhurst**—M. Forte, Fox Hollow Lane, Old Westbury, plans by Chapman Evans & Delehanty, 50 Broadway, New York, Zone 4, 20 story, 454 unit 203 x 445 ft. APARTMENT, 88-22 55 Ave. $7,000,-000.

▲ **N. Y., Elmhurst**—Yeshiva Tarsh Vodaath, 141 S. 3 St., Brooklyn, Zone 11, plans by Oscar Silverstone, 37 W. 57 St., New York, Zone 19, 12 story, 302 unit 174 x 299 ft. APARTMENT, 94-15 58 Ave. $3,500,000.

▲ **N. Y., Flushing**—First National Realty & Constr. Corp., 630 Third Ave., New York, Zone 17, plans by Leo Stillman, 332 E. 149 St., New York, Zone 51, two 6 story, 48 units each 78 x 146 ft. APARTMENTS; four 6 story, 60 units each 77 x 196 ft. APARTMENTS, Willets Point Blvd. and 147 St. $5,000,000.

▲ **N. Y., Jamaica**—Crossway Motor Hotels, Inc., 24 Tarrytown Rd., White Plains, plans by Brodsky Hopf & Adler, archts.-engrs., 220 E. 23 St., New York, N. Y., 250-room MOTEL, Idlewild Airport. $3,000,-000. Bids about Apr. 1, 1962. CD 9/18/61.

▲ **N. Y., Jamaica**—H. H. Pensig & N. Paterson, 257 W. 38 St., New York, Zone 18, plans by M. & D. Weston, 44 Court St., Brooklyn, Zone 1, 12 story, 310 unit 146 x 306 ft. APARTMENT, 182-15 Hillside Ave. $3,344,000.

▲ **N. Y., New York**—The Durst Organization, 200 E. 42 St., Zone 17, plans by Emory Roth & Sons, 400 Park Ave., Zone 22, 20 story OFFICE, 757 3 Ave. and E. 47 St. $5,000,000. Jas. Ruderman, 32 Union Sq., Zone 3, struc. engr. DiGiacomo Caretsky & Assocs., 19 W. 44 St., Zone 36, mech. engrs. CD 5/12/61.

▲ **N. Y., New York**—Herbert Fischbach, 545 Madison Ave., Zone 22, plans by Emery Roth & Sons, 400 Park Ave., Zone 22, 18 story OFFICE, 771-81 3 Ave. and 205-07 E. 48 St. $3,500,000. A. J. Kleinberger, 551 Fifth Ave., Zone 17, mech. engr. Lev Zetlin, 114 E. 32 St., Zone 16, struct. engr. CD 5/8/61.

▲ **N. Y., New York**—Norbert Holzer, 22 W. 48 St., Zone 36, plans by Robert L. Bien, 342 Madison Ave., New York 17, N. Y., 17 story APARTMENT, 1533-47 York Ave., $3,500,000; 18 story APARTMENT, 1511-17 York Ave., $2,500,000. M. P. Zacharius & Assocs., 34 W. 34 St., Zone 1, N. Y., mech. engrs. CD 1/30/61.

▲ **N. Y., New York**—Kratter Corp., 521 5 Ave., Zone 17, plans by Kelly & Gruzen, 10 Columbus Circle, Zone 19, 33 story, penthouse APARTMENT, west side First Ave. from E. 63 to E. 64 Sts. Over $10,000,000. Cosentini Assocs., 10 Columbus Circle, Zone 19, mech. engrs. Weinberger Frieman Leichtmann & Quinn, 20 Vesey St., Zone 7, struct. engrs. CD 10/24/61.

▲ **N. Y., New York**—Rose Assocs., 529 5 Ave., New York, Zone 17, plans by Boak & Raad, 175 5 Ave., New York, Zone 10, two 22-story, 480-unit Leland House APARTMENTS, Bruckner Blvd. and Leland Ave. Over $5,000,000. Robt. Rosenwasser, 375 5 Ave., New York, Zone 16, struct. engr. Theodore J. Kauffeld, 150 Broadway, New York, Zone 38, mech. engr.

▲ **N. Y., New York**—Twelve Ten Corp., 3 East 54 St., New York, Zone 22, plans by Emery Roth & Sons, 400 Park Ave., New York, Zone 22, 30 story OFFICE, 641-657 8 Ave. W. 41, W. 42 Sts. $8,300,000.

▲ **N. Y., Roosevelt**—Roosevelt Field, Inc., c/o Webb & Knapp, Inc., 383 Madison Ave., New York, Zone 17, plans by Francis X Gina Assocs., 219 E. 44 St., New York, Zone 17, 3 story, 325,000 sq. ft. Alexander's DEPARTMENT STORE, Old Country Rd. east of Meadowbrook Parkway, Roosevelt Field. $8,000,-000. Constr. early 1962.

▲ **O., Dayton**—Trustees, Miami Valley Hospital, 1 Wyoming St., COMBINATION HOME, HOSPITAL, SCHOOL for HANDICAPPED CHILDREN. $2,500,000.

▲ **O., Euclid**—S. Simon Constr. Co., 1463 Warrensville Center Rd., Cleveland, Zone 21, SHOPPING CENTER, Euclid Ave. and E. 276th St. $5,000,000.

▲ **Tex., Houston**—Brazos Presbyterian Homes, Inc., c/o Wilson, Morris, Crain & Anderson, archts., 3330 Graustark St., 6 story, 216-unit APARTMENT. $2,-700,000.

▲ **Wis., Manitowoc**—J. O. Johnson, 715 New York Ave., plans by Thern Assocs., Inc., 505 N. Main St., Oshkosh, MOTEL, Guest House Inn. $3,000,000.

▲ **Man., St. James**—The Salvation Army, 20 Albert St., Toronto, Ont., plans by Agnew, Peckham Assocs., 200 St. Clair Ave. W., Toronto, Ont., SALVATION ARMY GRACE GENERAL HOSPITAL, Portage Ave. $7,500,000. CD 6/26/59.

▲ **N. S., Halifax**—Lord Nelson Hotel Co., c/o J. Philip Dumaresq & Assocs., 89 College St., 200 to 250 room HOTEL ADDN. $2,500,000. Bids Spring 1962.

▲ **Ont., Toronto**—James Worral, c/o Elmer Tampold, archt., 120 Eglinton Ave. E., three 10 story APARTMENTS, Pharmacy Ave. $4,500,000.

▲ **Que., Montreal**—Bd. Governors, McGill University, McGill St., BIOLOGICAL SCIENCE BLDG., on campus, $4,500,000; PHYSICAL SCIENCES CENTRE EXTENSION, on campus, $2,300,000; multi-story HUMANITIES and SOCIAL SCIENCES BLDG., McTavish St., over $500,000.

INDUSTRIAL BUILDINGS

▲ **N. Y., New York**—Consolidated Edison Co., 4 Irving Pl., Zone 3, Leonard St. SUBSTATION No. 2, Franklin St. and West Broadway.

▲ **Tex., San Angelo**—West Texas Utilities Co., 3rd and Cypress Sts., Abilene, Unit No. 1, 100,000-kw ELECTRIC POWER PLANT, Lake Nosworthy. $10,000,000. Bechtel Corp., 220 Bush St., San Francisco, Calif., engrs. CD 10/14/60.

▲ **Que., Tracy**—Atlas Steels Ltd., Welland, Ont., 48-in. stainless steel strips producing STEEL MILL. $40,000,-000. Constr. soon.

PUERTO RICO

▲ **Puerto Rico, Ponce**—Commonwealth Oil Refining Co., Texas National Bank Bldg., Houston, Tex., U. S. A. 50 mill. lbs. annual capacity PETROCHEMICAL PLANT. $6,000,000. CD 11/26/57.

LATIN AMERICA

▲ **PARAGUAY**—Ing. Martinez Milos, Dir. General of Hys., Asuncion, ROAD, paving Asuncion-Encarnacion Highway. $6,000,000.

FOREIGN

▲ **Africa**—Administration Council, made up of Governments of Swaziland, Mbahane, Basutoland, Masero and Bechuanaland, Makeking, 140 mi. RAILROAD from Ngwenya (Bomvu Ridge) to the Mozambique frontier. $22,400,000. (Correction—capital of Swaziland). CD 10/26/61.

▲ **Italy**—Pirelli Societa per Azioni, 41 via Assisi, Rome, TIRE PLANT Villafranca, Tirreno, near Messina. $3,200,000.

▲ **Turkey, Ankara** — State Hydraulic Works, Ankara, Turkey, development WATER SUPPLY, incl. five earth-fill dams totaling 6,220,000 cu. yds.; 20 mi. concrete-lined canal; 65 mi. rein.-con. pipes 5 to 9 ft. diam.; and 2 mi. tunnel. $35,000,000.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲† **Vermont**—BA 12/7—U. S. Eng., 111 East 16th St., New York 3, N. Y., REHABILITATION approx. 4,157 ft. BREAKWATER with approx. 23,000 short tons bedding stone, 61,000 tons core stone and 78,000 tons cover stone reinforcing of lakeside of existing breakwater and recapping with stone to original top elevation of breakwater, Burlington, CIVENG-30-075-62-20. $1,500,000. Plans deposit $10. CD 10/3/61.

BUILDINGS—BA

▲ **Conn., Ansonia** — BA 11/28 — Housing Auth., 15 Maple St., 11 three story Riverside APARTMENTS, A: all 11 bldgs., B: 7 bldgs. and service bldg. or C: 4 bldgs. Seb. J. Passanesi, 164 Court St., Middletown, archt. Fred S. Dubin Assocs., 635 Farmington Ave., Hartford, engrs. CD 10/10/61, under LB.

▲ **Mass., Boston**—BA 11/28—Boston University, 755 Commonwealth Ave., (selected list bidders), LAW SCHOOL. $2,000,000. Edwin T. Steffian, 711 Boylston St., archt. CD 8/31/60.

▲ **R. I., Kingston**—BA 11/30—State R. I. Atomic Energy Comn., University of Rhode Island, NUCLEAR SCIENCE CENTER, Fort Kearney. $1,000,000. Metcalf & Eddy, Statler Bldg., Boston, Mass., engrs. CD 7/12/61, under LB.

BUILDINGS—LB & CA

▲ **Stone & Webster Engineering Corp.**, 90 Broad St., New York, N.Y. design and construct 340,000 kw. L Street GENERATING STATION, South Boston, BOSTON, MASS. Boston Edison Co., 182 Tremont St., Boston 12, Mass. CD 10/12/61, under CA.

▲ **E & F Constr. Co.**, 94 Wells St., Bridgeport, Conn., CA $2,426,400, Convert Mill Plain Elementary School into HIGH SCHOOL ADDN., FAIRFIELD, CONN. Town, Purch. Auth., Town Hall, Fairfield, Conn. BA 10/6/61. CD 10/11/61, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **N. Y., Brooklyn**—BA 12/5—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Contr. I-OH-10, reconstr. SLUDGE DIGESTION TANKS, Owls Head Pollution Control Proj. $1,000,000.

BUILDINGS—BA

▲ **Md., Baltimore**—BA 11/22—City, Bureau Bldg. Constr., 410 Municipal Bldg., Zone 2, 2 story, brick, block, concrete, steel Madison Square ELEMENTARY SCHOOL, Eden, Biddle, Carolie and Chase Sts. $1,100,000. Plans deposit $30. Edw. H. Glidden, Jr., 107 E. 25 St., Zone 18, archt.

▲ **Pa., Swiftwater**—BA 11/22—National Drug Co. (Div. of Richardson-Merrell, Inc., 122 E. 42nd St., New York 17, N. Y.) 4663-85 Stenton Ave., Phila., Zone 44, LABORATORY and OFFICE, $2,000,000. W. Stuart Thompson & Assocs., 60 E. 42nd St., New York, N. Y., archts. CD 10/23/61.

† **Pa., Erie**—BA 11/28—Dpt. of Navy, Phila. Naval Base Center, ARMED FORCES RESERVE TRAINING CENTER, NBy 30872. $945,000. Nelson-Goldberg & Heidt, Baldwin Bldg., archts.-engrs.

△ **Pa., Harrisburg**—BA 12/13—General State Auth., 18th and Herr Sts., Harrisburg, general contract, electrical, plumbing, heating, ventilating, and air conditioning William Penn Memorial MUSEUM in Capitol Park Extension Area, Proj. No. 946-1.1, $5,000,000. Plans deposit $150. Lawrie & Green, 321 N. Front St., Harrisburg, archts. CD 12/26/57.

BUILDINGS—SLC

▲ **N. J., Haddonfield**—Cherry Hill Inn, P.O. Box 311, Camden, soon lets contract 2 story, 115,000 sq. ft. Cherry Hill INN ADDN., CONVENTION BLDG. $1,000,000. George W. Ewing Co., Broad and Chestnut Sts., Phila., Pa., archt. CD 9/22/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Wright & Kremers, Inc.**, Pine Ave. and Main St., Niagara Falls, N. Y., LB $3,880,935, (4 bidders), 2 story, OBSERVATION (Overlook) BLDG., 1 story, bsmnt. fdn. 89 sq. ft. RECEPTION BLDG., for Robert Moses Niagara Power Plant, Lewiston, Niagara Co., Spec. No. PA-N-23043, Niagara Contr. No. N34, NEW YORK. Power Auth. State of New York, 18 Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. BA 11/9. CD 10/31/61.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 11/8, BRIDGE,

Cayuga Constr. Corp., 30 Vesey St., New York, N. Y., LB $1,382,024, constr. Interstate Rte. 80 bridge over Hackensack River, Bergen Co. CD 10/19/61.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 11/2, ROAD,

L. Zimmerman & Sons, Inc., 278 Hillside Ave., Hillside, N. J., LB $1,058,750, (5 bidders), modernizing Rte. U.S. 22 from Washington Ave., Green Brook Twp. to Middle Brook Stream west of Thompson Ave., Bridgewater Twp., Somerset Co. CD 10/16/61.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, ROAD,

James D. Morrissey, Inc., 9119 Frankford Ave., Phila. 14, Pa. CA $3,398,689, 35,115 ft. constr. divided hy. consist. c. conc. pvt. variable in width, 8 bridges T. R. U. S. 209, Hamilton Twp., Monroe Co., BA 10/13/61. CD 10/18/61, under LB.

▲ **Malan Constr. Co.**, 2 Park Ave., New York, N. Y., CA $7,175,000, general constr. Belmont FILTER PLANT REHABILITATION, Proj., incl. piping, pretreatment structures and equipment, chemical bldg., structures and equipment, structures for addnl. filters, rehabilitation existing filter and admin. bldgs., conversion two slow sand filters to filtered water reservoir, and allied work, PHILA, PA. Dpt. Procurement, City Hall Annex, Phila, Pa. Grand total $8,903,059. BA 6/20/61. CD 6/22/61, under LB:

The Pittsburgh Constr. Co., 1235 Washington Blvd., Pittsburgh, Pa., CA $1,165,684, FILTER EQUIPMENT, for Belmont Filter Plant, (Phila, Pa.);

Welsbach Corp., 1500 Walnut St., Phila., Pa., CA $449,175, HEATING and VENTILATING for Belmont Filter Plant (Phila, Pa.);

Williard, Inc., Germantown and Sedgeley Aves., Phila., Pa., CA $113,200, PLUMBING, for Belmont Filter Plant, (Phila, Pa.)

BUILDINGS—LB & CA

▲ **Harte & Co., Inc.**, 49 Dumpont St., Brooklyn 22, N. Y., Owner Builds, $1,000,000, 2 and 3 story 44,000 sq. ft. on 110,000 sq. ft. site LABORATORY and OFFICES, 77-87 Commercial St., BROOKLYN, N. Y. CD 6/19/61.

▲ **Praver Assocs.**, 163-18 Jamaica Ave., Jamaica, N. Y., Owner Builds, Over $2,000,000, 3 and 4 story, crescent-shaped Constellation HOTEL, Baisley Blvd. between 134 and 135 Sts., JAMAICA, N. Y. CD 11/6/61.

▲ **Valles Ave. Corp.**, 45 Maple Ave., Hastings, N. Y., Owner Builds, $1,250,000, 6 story, 100-unit APARTMENT, west side Valles Ave. north of W. 254 St., Riverdale, Bronx Boro, NEW YORK, N. Y. Lawrence M. Rothman, 103 E. 125 St., New York 35, N. Y., archt.

▲ **L. A. Wenger Contg. Co., Inc.**, 88 Golding Ave., West Babylon, N. Y., LB $1,219,700, JUNIOR HIGH SCHOOL ADDN., ALTERATIONS, ROOSEVELT, N. Y. Bd. Educ., UFSD No. 8, Junior High School, Roosevelt, N. Y. BA 11/2. CD 10/18/61.

▲† **Essential Constr. Co. & Himount Constr. Ltd.**, 1325 Inwood Terrace, Fort Lee, N. J., LB $1,046,028, (7 bidders), rehab. and expansion MICHIE STADIUM, U. S. Military Academy, ENG-30-075-62-40, WEST POINT, N. Y. U. S. Eng., 111 E. 16 St., New York 3, N. Y. BA 11/2. CD 10/2/61.

▲ **John H. Eisele Co., Inc.**, 18 E. 41 St., New York 17, N. Y., CA $1,248,000, 3 and 4 story, 50,000 sq. ft., frame, brick DORMITORY, Elizabeth Seton College, N. Broadway, YONKERS, N. Y. Archdiocesan Bldg. Comn., 451 Madison Ave., New York 22, N. Y. BA 10/31. CD 11/3/61, under LB.

Housing Auth. Town of Boonton, 125 Chestnut St., Boonton, N. J., rejected bids Oct. 31, Proj. NU52-1, 38-unit HOUSING, Chestnut St., BOONTON, N. J. Est. $906,000. CD 10/23/61.

▲ **Richards & Robbins**, 3 Fairfield Dr., Morristown, N. J., Owner Builds, $1,000,000, 50 HOUSES, Horseneck Rd., CALDWELL, N. J. Wm. H. Lushear, 241 Woodland Rd., Madison, N. J., archt.

▲ **A. A. LaFountain Inc.**, 161 Beech St., Hackensack, N. J. CA $1,298,000, est. $2,500,000, HIGH SCHOOL ADDN., HACKENSACK, N. J. Bd. Educ. City Hackensack, 355 State St., Hackensack, N. J. BA 10/23/61. CD 10/25/61, under LB.

▲ **Nollim Corp.**, 12 Center St., Metuchen, N. J., Owner Builds, $12,000,000, 750 HOUSES, Paterson Ave., NEWTON, N. J. Peter Grygotis, 306 A'dene Rd., Roselle, N. J., archt.

▲ **Richards & Robbins**, 3 Fairfield Dr., Morristown, N. J., Owner Builds, $1,750,000, 80 HOUSES off Sunnyhill Rd., ROCKAWAY, N. J. W. H. Lushear, 241 Woodland Rd., Madison, N. J. archt.

▲ **Melvin Konwiser**, 21 North Michigan Ave., Kenilworth, N. J., Owner Builds, $1,400,000, 60 HOUSES, Old Rte. 202, off Rte. 23, WAYNE, N. J. Rotwein & Blake, 1018 Stuyvesant Ave., Union, N. J., archts.

▲ **Rea Constr. Co.**, 136 Bradford Ave., Pittsburgh 6, Pa., LB $1,247,000, est. $1,500,000 (8 bidders), general constr. HIGH SCHOOL, for Center Twp. Sch. Bd., B9-697-1, ALIQUIPPA, PA. State Pub. School Bldg. Auth., 101 S. 25th St., Harrisburg, Pa. BA 11/2/61. CD 10/18/61.

▲ **Solida Corp.**, 8000 York Rd., Elkins Park, Pa., Owner Builds, $4,000,000, RESIDENTIAL DEVELOPMENTS (260), Meetinghouse Rd., HORKSHAM, PA. Lester H. Weckesser, Erlton, N. J., archt.

▲ **David Warren Constr Co.**, 50 E. Wynnewood Rd., Wynnewood, Pa., Owner Builds, $7,500,000, RESIDENTIAL DEVELOPMENT (500) Ridge Pike, LAFAYETTE HILLS, PA. S. Zel Bender, 225 N. 6th St., Camden, N. J., archt.

▲ **Arthur A. Kober Co.**, 9 Union Ave., Bala Cynwyd, Pa., CA $5,000,000, 20 story, 33,000 sq. ft. Penn Center Motor HOTEL, 20th and Market Sts., PHILA., PA. Carheart Corp., c/o Charles Luckman Assocs., archts., 680 Fifth Ave., New York, N. Y.

▲ **Charles E. Smith Co., Inc.**, 1717 Pennsylvania Ave. N.W., Wash., D. C. CA $3,000,000, 10 story APARTMENT and HOTEL, 1616 Rhode Island Ave. N.W., WASH., D. C. Rhode Island Assocs., 1717 Pennsylvania Ave. N.W., Wash. Corning, Moore, Elmore & Fisher, 1302 18th St., N.W., Wash., D. C., archts.

SOUTH

BUILDINGS—BA

▲ **Ala., Anniston**—BA 11/28—First Presbyterian Church, Quintard and 10th Sts., CHURCH SANCTUARY-EDUCATIONAL BLDG. $1,000,000. Harold Wagoner, Architects Bldg., Phila., Pa., archts. CD 2/8/60.

▲ **Ala., Tuscaloosa**—BA 11/28—Tuscaloosa Housing Auth., City Hall, 100-units low rent HOUSING, $1,000,000. Plans deposit $100. CD 10/24/60.

▲ **Ga., Marietta**—BA 11/30—Marietta Housing Auth., 204 Wayland St., 125-units low rent HOUSING, $1,250,000. Plans deposit $75. William R. Tapp, Jr., 110 Austin Ave., archt. CD 1/31/61.

▲† **S. C., Charleston**—BA 12/12—Director, Southeast Division, Bureau Yards & Docks, Bldg. No. 13, U. S. Naval Base, Charleston, FLEET BALLISTIC MISSILE SUBMARINE TEAM TRAINING BLDG., U. S. Naval Base, NBy-37355, Spec. 37355/61. Over $1,000,000. CD 5/1/61.

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—State Hy. Dpt., 1221 East Broad St., Richmond, ROADS.

Va.—**S. T. Wooten Constr. Co., Inc.**, Rte. 1, Stantonsburgh, N. C., CA $1,078,545, grading, conc. culvert Interstate 95, 2.9 mi. from Rappahannock River to two mi. north Rte. 17, Strafford Co.;

Va.—**Dickerson, Inc.**, Box 448, Monroe, N. C., CA $794,351, grading, three conc. culverts 3.5 mi. Interstate 95, from ½ mi. north of US 1 to 0.2 mi. south Rte. 3 near Fredericksburg, Spotsylvania Co.;

Va.—**Taylor & Keebler, Inc.**, Branch Ave., Clinton, Md., CA $939,176, grading, drainage 2.2 mi. Interstate 95 from 0.2 mi. south Rte. 3 to Rappahannock River bridge, plus ramps and 1.22 mi. grading and paving to divide Rte. 3 each side of the interstate, Spotsylvania Co. Grand total $2,812,072. BA 10/25/61. CD 10/27/61, under LB.

▲ **ALABAMA**—State Hy. Dpt., Montgomery, Zone 4, ROAD,

Moss-Thornton Co., Inc., Leeds, Ala. and **Southern Amiesite Asphalt Co.**, 3401 5th Ave. N., Birmingham, Ala., CA $1,747,879, base, bit. pave 11 mi. US 78 from Sayre SE to Adamsville, Jefferson Co. BA 9/29/61, CA 11/3/61. CD 10/9/61, under LB.

▲† **Standard Dredging Co. of New Orleans**, 6201 France Rd., New Orleans, La., CA $1,423,950, DEEPEN MOBILE SHIP CHANNEL to 39 ft., ALABAMA. U. S. Eng., P.O. Box 1169, Mobile, Ala. BA 10/27/61. CA 11/2/61. CD 11/1/61, under LB.

▲ **Panama Inc.**, Tennessee Bldg., Houston, Tex., CA Est. $3,835,000, 59 mi. 36 in. GAS LINE, Houma, Terrebonne Parish to Bohemia, Plaquemines Parish; CA Est. $1,200,000, 216 mi. 30 in. GAS LINE, Bayou Sale Junction St. Mary Parish to W. Monroe Junction, Ouchita Parish, LOUISIANA. United Gas Pipe Co., Box 1407, Shreveport 92, La. CD 6/12/61.

▲ **KENTUCKY**—Commonwealth Ky., Dpt. Hys., Frankfort, ROAD,

Ralph Myers Contr. Corp., Box 230, Salem, Ind., CA $2,757,986, grade, surf. service roads 5.456 mi. Covington-Lexington I 75-6(10)141), Grant Co. BA 9/29, CA 10/27. CD 10/3/61, under LB.

▲ **McDowell & McDowell**, 718 Murfeesboro Rd., P.O. Box 1144, Nashville 10, Tenn., LB $2,199,105, RAILROAD TRACK road bed between Grand Rivers and Dulaney for Barkley Dam Proj., Caldwell, Livingston and Lyons Counties, KENTUCKY. Illinois Central R.R. Co., 135 E. 11 Place, Chicago, Ill. BA 11/1. CD 10/6/61.

† **American Bridge Co., Div. U. S. Steel Corp.**, 700 N. 39th St., Birmingham, Ala., CA $886,326, (7 bidders), STEEL TRANSMISSION TOWERS, Melton Hill Dam, TENNESSEE. Tennessee Valley Auth., New Sprankles Bldg., Knoxville, Tenn.

BUILDINGS—LB & CA

▲ **John Tester & Sons, Inc.**, 1101-6th St. S.W., Clinton, Md., CA $2,721,432, George Marshall HIGH SCHOOL near Tysons Corner, FAIRFAX, VA. Fairfax County Bd. Educ., Fairfax, Va. BA 11/2/61. CD 11/6/61, under LB.

▲ **John McShain, Inc.**, 3501 Sinclair Lane, Baltimore, Md., CA Approx. $2,000,000, St. Vincent De Paul SEMINARY, Boynton, West Rd. and SR 809, near BOYNTON BEACH, FLA. Congregation of the Mission, c/o Urbahn, Bryton & Burrows, archts., 635 Madison Ave., New York, N. Y.

Frank J. Rooney, 712 SE 17th St., Fort Lauderdale, Fla., CA Est. $800,000, HOTEL, FORT LAUDERDALE, FLA. Coral Ridge Inn, 716 NE 6th Ave., Fort Lauderdale, Fla.

▲ **A. W. Smith & Son**, 607 Lakeshore Dr., Leesburg, Fla., CA $1,393,850, Leesburg General HOSPITAL, LEESBURG, FLA. City, City Hall, Leesburg, Fla. BA 9/28/61. CD 10/10/61, under LB.

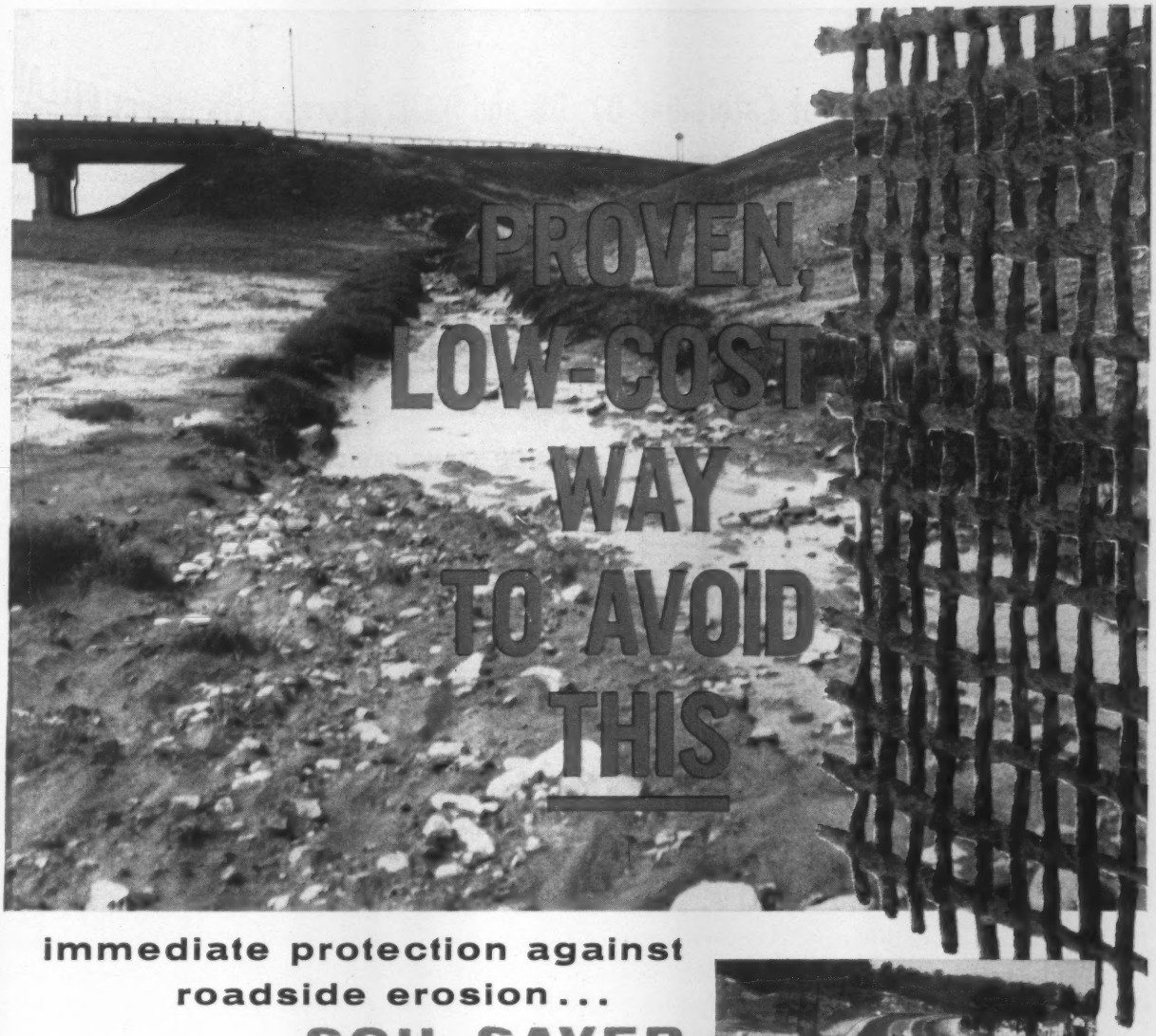
▲ **Kaskell Corp.**, 6801 Collins Ave., Miami Beach, Fla., CA $1,140,000, CLUBHOUSE, 4400 NW 87th Ave.; CA $750,000, MOTEL, 4400 NE 87th Ave., MIAMI, FLA. Doral Country Club, 6801 Collins Ave., Miami Beach, Fla. Melvin Grossman, 420 Lincoln Rd., Miami Beach, Fla., archt.

▲ **Lee Development Co.**, 2100 Keystone Blvd., North Miami, Fla., Owner Builds, $1,000,000, 120 units APARTMENT, PALM BEACH, FLA. A. T. Pochert, 687 NE 79th St., Miami, Fla., archt.

† **Sarullo Constr. Co.**, P.O. Box 5155, Greenville, Miss., CA $805,000, 1 story, 47,000 sq. ft. masonry air-conditioned ADMINISTRATION BLDG., CIVENG-22-079-62-4B, VICKSBURG, MISS. U. S. Eng., Waterways Experiment Station, Box 613, Vicksburg, Miss. BA 10/17. CD 10/24/61, under LB.

▲ **Badger Mfg. Co.**, 230 Bent St., Cambridge, Mass., CA design and construct 100 m. lb/yr capacity PROPYLENE PURIFICATION UNIT, LAKE CHARLES,

(Continued on page 113)



immediate protection against roadside erosion...

SOIL SAVER

Each day, erosion from rain and water run-off cuts into the highway investment of every state. If you share in the responsibilities of highway planning, building and renewal, then erosion, its defeat and prevention, is your concern. You, of all people, should know about Soil Saver.

Soil Saver is a heavy jute mesh. It is simple as dirt, and almost as cheap! It costs, in fact, some 75% less than sod, and 1400% less than asphalt or concrete paving. Wind, water or growing grass cannot displace it. Many leading state highway design engineers across the nation now include it in their original specifications. They have seen how it protects seed and soil in critical areas until grasses take over.

Soil Saver belongs in your plans. Get the facts . . . write for full details to Dept. EN-111.

LUDLOW TEXTILE PRODUCTS
NEEDHAM HEIGHTS 94, MASS.
A Division of Ludlow Corporation

ABOVE: Soil Saver applied to critical center of steep grade median strip. **BELOW:** Stabilizing grass growing through Soil Saver heavy jute mesh.

Ludlow

SOIL SAVER
Heavy Jute Mesh
SIMPLE AS DIRT AND ALMOST AS CHEAP

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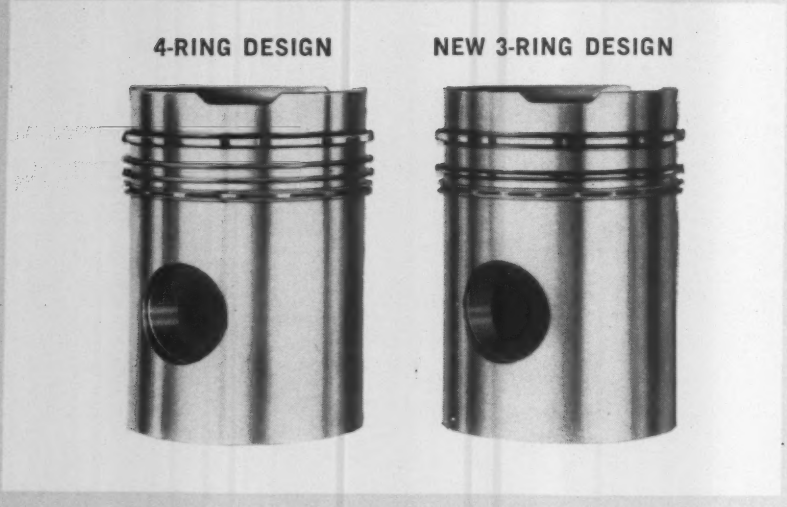
CAT CATERPILLAR

Parts you can trust
...cost less per hour

New Piston and Ring Combination Cuts Oil Consumption 33-50% ...Lasts Hundreds of Hours Longer!



What makes it so different? Look at the two Caterpillar-made pistons. Notice in the new design that *both* compression rings are now deeply seated in grooved cast iron (indicated in yellow) instead of only the top ring. Since cast iron is able to resist groove "pound out," both compression rings are held firmly *longer* in the correct position for maximum ring-to-liner sealing. Compression loss and blow-by *behind* rings and around grooves is delayed hundreds of hours, too.

The new intermediate compression ring is a "twist" ring, so-called because it changes position in the groove during the power stroke. It actually "twists" so its face has *greater sealing area* at the liner than regular rings—reducing the number of compression rings normally required. At the same time, it thins the film of oil left by the regular oil control ring. This leaves less oil to burn away which contributes to the new piston's better oil control and longer ring life.

All rings now have a new look, too . . . *each and every* face is thickly chrome plated against wear. They are also "bright lapped" to such brilliance that any flaws can be easily seen and the faulty ring rejected. Such quality control assures almost perfect seating right from the start, eliminating break-in blow-by, slobbering and scuffing.

Cost? Pistons with the *extra* cast iron bands cost *slightly more*, but ring sets are less! Once you change over, your tractor maintains its power longer, your fuel and oil bills go down, and your next set of replacement rings will be less. Your Caterpillar Dealer has them in stock now.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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Diesel Engines • Tractors • Motor Graders • Earthmoving Equipment

(Continued from page 110)

LA., Cities Service Oil Co., 60 Wall St., New York 5, N. Y.

▲ **Darin & Armstrong,** 137 W. Benson, Reading, O., CA $1,019,000, PLANT ADDN., LEXINGTON, KY. Square D Manufacturing Co., 1237 New Circle Rd. N.E., Lexington, Ky. BA 10/25, CA 10/31. CD 10/19/61.

▲ **Robert McKee General Contractor, Inc.,** 2708 Inwood Rd., Dallas, Tex., CA $4,770,000, 247 unit "800" APARTMENT, LOUISVILLE, KY. F. W. Drybrough, 807 S. 4 St., Louisville, Ky. BA 10/31, CA 11/2. CD 11/2/61, under LB.

▲ **Anderson & Gore,** Life & Casualty Tower, Nashville, Tenn., LB $1,068,900, Cotton States OFFICE ADDN., NASHVILLE, TENN. State of Tennessee, Capitol Bldg., Nashville, Tenn. BA 10/31/61. CD 10/19/61.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **Ill., Chicago**—BA 11/22—Dpt. Purchases, City Hall, FURNISH, FABRICATE, ERECT STEEL for 22 span ELEVATED STRUCTURE, South Rte. Expressway, Proj. S 2424.3-2HF., $1,739,000, ELEVATED HIGHWAY STRUCTURE, South Rte. Expressway, Proj. S 2424/3-2H, $1,238,000. CD 6/21/57.

▲ **Ill., Chicago**—BA 11/28—Dpt. Purchases, City Hall, GRADING, PAVING, DRAINAGE, LIGHTING, LANDSCAPE SOUTH ROUTE EXPRESSWAY, Pershing to 35th Sts., Proj. S 2323.6-2P, $2,600,000. CD 6/21/57.

BUILDINGS—BA

▲ **O., Cincinnati**—BA 11/24—Mabley & Carew Co., Div. Allied Stores, Inc., 5th and Vine Sts., 9 story, DEPARTMENT STORE ADDNS., ALTERATIONS. $4,000,000. A. M. Kinney, Inc., 2912 Vernon Pl., archt. Malcomb Beattie, 401 5th Ave. New York, N. Y., engr. CD 7/10/61.

▲ **O., Beloit**—BA 11/30—West Branch Bd. Educ., Box 325, HIGH SCHOOL. $1,150,000. Plans deposit $25. Kling, Frost, Philpott & Smith, 661 Wick Ave., Youngstown, achts. CD 11/14/60.

▲ **O., Cleveland**—BA 12/5—Cuyahoga Heights Bd. Educ., 4820 E. 71st St., Zone 25, HIGH SCHOOL ADDN., Cuyahoga Heights. $1,250,000. Plans deposit $50 each, for general and mechanical contracts. Fulton, Dela Motte, Larson & Nassau, 6014 Euclid Ave., Zone 3, archts. CD 1/9/61, under O., Cuyahoga Heights as project location.

▲ **Ill., Mount Vernon**—BA 12/6—Jefferson Co. Housing Auth., Courthouse. 175 unit low rent HOUSING $2,000,000. CD 6/23/59.

▲† **Mich., Detroit**—BA 12/14—U. S. Eng., P.O. Box 1027, Detroit, Zone 31, 2 story, 250,000 sq. ft., rein.-con. frame, face brick air-conditioned COMMAND HEADQUARTERS and FACILITIES, Army Ordnance Tank-Automotive Command, Detroit Arsenal, north side 11 Mile Rd., Sherwood Ave. between Mound and Van Dyke Rds., Center Line, ENG-20-064-62-12 $5,000,000. H. E. Beyster & Assocs., 9152 Woodward Ave., Zone 2, archts. CD 10/31/61.

HEAVY CONSTRUCTION—LB & CA

▲ **R. E. Dailey & Co.,** 21675 Telegraph Rd., Southfield, Mich., CA $1,930,000, Contract 3, SEWAGE PLANT; CA $630,000, Contract 2, PUMPING STATION, TERRE HAUTE, IND. Bd. P. Wks., City Hall, Terre Haute, Ind. Grand total $4,667,000. CD 6/4/45.
Square & Marra Constr. Co., 4990 Massachusetts Ave., Indianapolis, Ind., CA $2,107,000, Contract 1, INTERCEPTOR SEWERS (Terre Haute, Ind.).

▲ **American Bridge, Div., US Steel Corp.,** 208 S. LaSalle St., Chicago 4, Ill., LB $1,178,566, BRIDGE SUPERSTRUCTURE, South Branch, Chicago River, and South Route Expressway, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. BA 11/3/61. CD 10/11/61.

▲ **Arcole Midwest Corp.,** 3225 Main St., Skokie, Ill., CA $1,185,699, ELEVATED HIGHWAY, South Rte. Expressway 18th to 16th Sts., Proj. 80.68-61-20, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. BA 10/18/61, CA 10/23/61, CD 10/23/61, under LB, Bridges;
Allied Structural Steel Co., 20 N. Wacker Dr., Chicago 6, Ill., CA $661,226, furnish, erect structural steel for ELEVATED HIGHWAY, Proj. 80.68-61-21, (Chicago, Ill.).

BUILDINGS—LB & CA

▲ **Bert Reid & Assocs.,** 1 Chillicothe Rd., Chagrin Falls, O., Owner Builds, $1,100,000, $500,000 first year (2 year program), 38 HOMES, MENTOR, O. George Howard Burrows, 16104 Chagrin Blvd., Cleveland 20, O., archt.

▲ **Budziak, DeGraeve & Kapral Builders,** 2711 Pleasant Valley Rd., Cleveland 34, O., Owner Builds, $7,000,000, $1,400,000 first year (five year program) 216 HOMES, Dogwood Estates, PARMA, O. John Kornick, 4185 Lee Rd., Cleveland 28, O. archt. CD 5/24/61.

▲ **Campbell, Lowrie & Lautermilch,** 6317 N. Broadway Ave., Chicago, Ill., CA $1,500,000, WAREHOUSE, OFFICE EXPANSION, HAMMOND, IND. American Maize Products Co., 113th and Indianapolis Blvd., Hammond, Ind. Shaw, Metz & Assocs., 208 S. LaSalle St., Chicago 4, Ill., archts. CD 10/12/61.

▲ **Chicago High Rise Corp.,** 720 N. Michigan Ave., Chicago, Ill., CA $8,000,000, APARTMENT, OFFICE, 535 N. Michigan Ave., CHICAGO, ILL. Michigan Terrace Corp., 208 S. LaSalle St., Chicago 4, Ill. BA 10/6/61, CA 11/1/61. CD 10/3/61, under Chicago High Rise Corp., as owner.

▲ **Johnson Drake & Piper Inc.,** 112 N. 7th St. Terre Haute, Ind., LB $1,107,000, general contract PHYSICS BLDG., URBANA, ILL. University of Illinois 256 Admin. Bldg., Urbana, Ill. Shaw Metz & Assocs., 208 S. LaSalle St., Chicago 4, Ill., archts.

▲ **Gebhard-Berghammer, Inc.,** 5420 West State St., Milwaukee, Zone 8, Wis., LB $1,079,456, (8 bidders), general contract Fritsche JUNIOR HIGH SCHOOL, MILWAUKEE, WIS. School Bd., 5225 West Vliet St., Milwaukee, Wis. BA 10/26/61. CD 9/19/61.

▲ **Christman Co.,** 408 Kalamazoo Pl., Lansing, Mich., CA $4,225,000, Total CA $5,150,000 RESIDENCE HALL, Western Michigan University, KALAMAZOO, MICH. State, State Bldg., Lansing, Mich. Ralph R. Calder Assocs., 1212 Kales Bldg., Detroit 26, Mich., archts. CD 4/16/56.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲† **Arkansas and Oklahoma**—BA 11/28—U. S. Eng., P.O. Box 867, Little Rock, Ark., BANK STABILIZATION, SHOOFLY BEND REVETMENTS and DIKES, River Mile 361.9 to River Mile 356.5 on right and left banks of Arkansas River, Fort Smith, Sebastian and Crawford Counties, Ark., and Sequoyah Co., Okla., ENG-03-050-62-58. $1,500,000. CD 11/2/61.

▲ **Tex., Galveston**—BA 11/29—Galveston Wharves, Pier No. 41, REHABILITATION PIER NO. 41, $1,400,000. Lockwood, Andrews & Newman, Inc., 1010 Waugh Drive, Houston, engr.

† **Kan., Wichita**—BA On Or About 12/12—U. S. Eng., Ballistic Missile Constr. Office, 5651 West 96 St., Los Angeles 45, Calif., MODIFICATION 36,000 sq. ft. EXISTING HANGAR, Bldg. No. 1107 for MISSILE ASSEMBLY and MAINTENANCE SHOP (MAMS); incl. air-conditioning and decontamination facilities; MODIFICATION 24,000 sq. ft. EXISTING WAREHOUSE No. 1090 for TECH. SUPPLY, utilities, parking areas, road work and fencing, Titan II, McConnell Air Force Base, ENG-04-548-62-10. Over $900,000. CD 4/27/60.

▲† **Oklahoma**—BA About 12/19—U. S. Eng., Box 61, Tulsa, RELOCATING McIntosh COUNTY ROADS (Area LI) and Haskel COUNTY ROADS, incl. bridges, culverts, fencing, riprap, guardrail, gravel surf. 13.3 mi. Eufaula Reservoir, Canadian River, CIVENG-34-066-62-62. $1,500,000. Plans deposit $10. CD 10/3/61.

BUILDINGS—BA

▲ **Ark., State College**—BA 12/5—Arkansas State College, State College Ark., MEN'S DORMITORY. $1,500,000. Plans deposit $100. Stuck, Frier, Lane & Scott, Inc., 217 E. Washington Ave., Jonesboro, archt. CD 11/2/61.

BUILDINGS—SLC

▲ **Tex., Dallas**—C. C. Young Memorial Home, Inc., 1431 Stemmons Ave., soon lets contract Blanton Gardens HOME, Mockingbird Lane and Lawther Drive, $1,300,000. Fisher & Jarvis & Associates, 725 Southland Center, archts. Wm. L. Cobb & Associates, 830 Interurban Bldg., Gregerson & Gaynor, 3010 Blackburn St., engrs. CD 11/1/61, under LB.

▲ **Tex., Kilgore**—Kilgore Community Hotel-Motel, Kilgore, soon lets contract masonry RESORT HOTEL-MOTEL, swimming pool, cabanas, $1,000,000-$1,750,000. Mackie & Kamrath, 2713 Ferndale Place, Houston, Tex., archts. Bernard Johnson & Assocs., 4926 Travis St. and MacKie & Kamrath, 2713 Ferndale Place, Houston, engrs. CD 6/9/60.

HEAVY CONSTRUCTION—LB & CA

▲† **Guy H. James Constr. Co.,** P.O. Box 9575, Oklahoma City, Okla. and **J. H. Beckman Constr. Co.,** P.O. Box 846, Sioux Falls, S. D., CA $7,531,000, DAM and OUTLET STRUCTURES, Wilson Dam and Reservoir, CIVENG-23-028-62-15, KANSAS. U. S. Eng., 911 Walnut St., Kansas City, Mo. BA 10/26/61. (Correction-contractors address). CD 11/6/61, under CA

▲ **OKLAHOMA and TEXAS**—State Hy. Dpt., Capitol 5, Oklahoma City, Okla. and State Hy. Dpt., Austin, Tex., BRIDGE
Cummins Constr. Co., Bass Bldg., Enid, Okla., CA $1,020,985. Interstate Bridge over Red River, US 277 near Randlett Proj. F 491-2, Cotton Co. BA 10/27/61, CA 11/6/61. CD 10/31/61, under LB.

▲† **Ashbach Constr. Co.,** 1910 W. Owasso Blvd., St. Paul, Minn., LB $1,145,676, est. $1,500,000. 227,000 cu. yd. CHANNEL EXCAVATION, RECTIFICATION, CHANNEL PAVEMENT, Brays Bayou, Fondred Rd. to Glen Blvd., ENG-41-243-62-20, TEXAS. U. S. Eng., P. O. Box 1229, Galveston, Tex. BA 10/26/61. CD 9/28/61

▲ **Houston Contg. Co.,** 3807 Buffalo Speedway, Houston, Tex., CA $3,440,000, 30 mi. 30 in. gas LINE LOOP, Victoria, TEXAS. Transcontinental Gas Pipe Line Corp., 3100 Travis St., Houston, Tex. CD 1/12/50.

▲ **NEW MEXICO**—State Hy. Dpt., State Hy. Bldg., Carrillos Rd., Santa Fe, ROADS,
N. M.—**Wayne A. Lowdermilk, Inc.,** P.O. Box 1165, Espanola, N. M., CA $1,427,055, est. $1,238,177, 2-lane, grade, subbase, base course, 1 major conc. box culvert, plant mix surf. approx. 10.343 mi. Union/Colfax County Line, Federal Aid Proj. No. F-046-1(9), Colfax Co.;
N. M.—**Broce Constr. Co., Inc.,** Box 1138, Tucumcari, N. M., CA $211,850, est. $227,039, 4 lane, grade, base course, cement treated base, curb and gutter, plant mix surf., 1 major conc. box culvert, approx. 0.798 mi. Jct. US 85 East to I-25 to Raton, Federal Aid Proj. No. US-1442(4), Colfax Co.;
N. M.—**Harry Trotz Constr. Co., Inc.,** 704 Solar Rd., N.W., Albuquerque, N. M., CA $349,190, est. $347,727, grade, emulsified asph. treated base, 2 course surf. treatment, 2 major conc. box culverts, approx.

(Continued on page 116)

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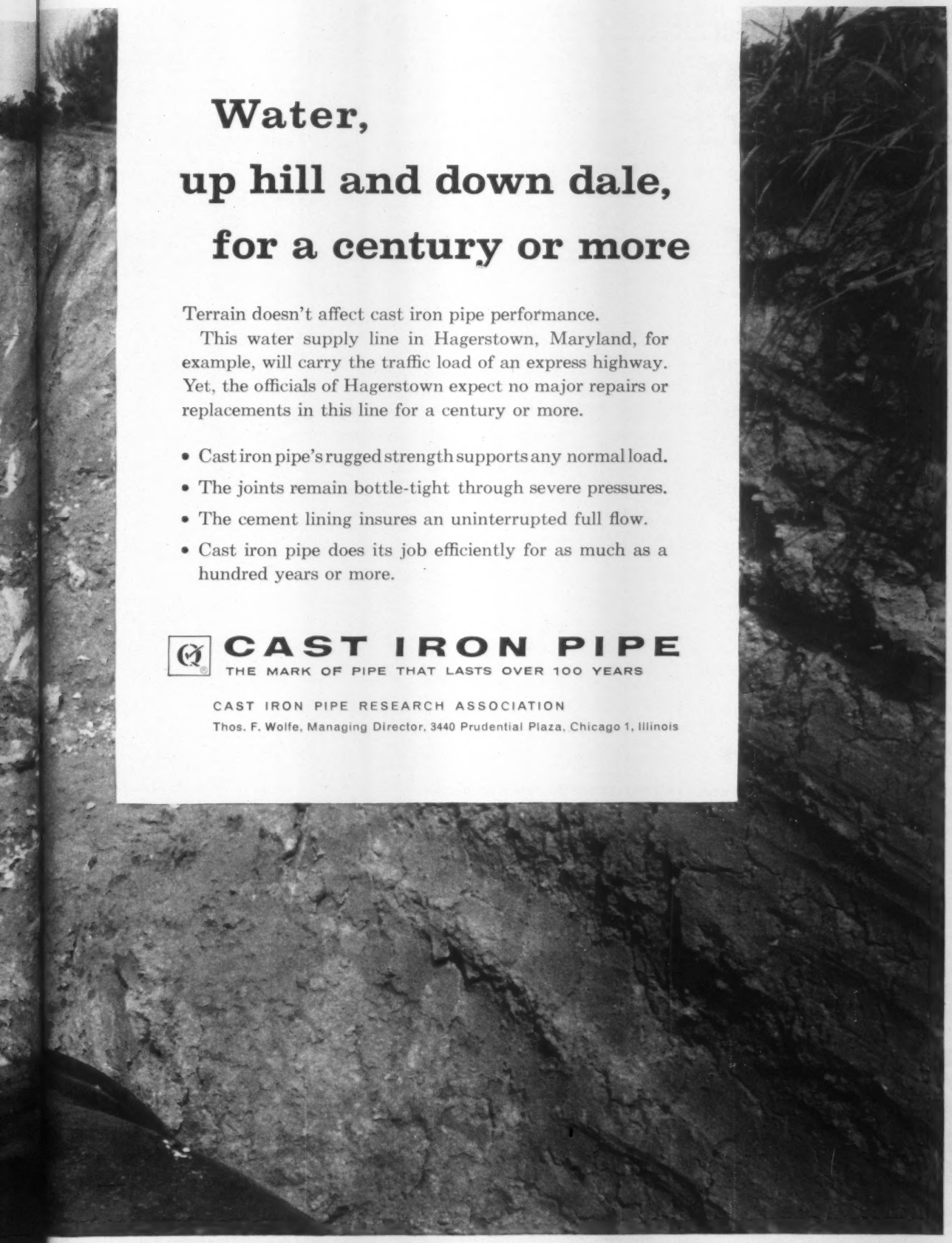
COMPANY_____

ADDRESS_____

CITY_____ ZONE___ STATE_____

UNIVERSAL FORM CLAMP CO.
1238 N. Kostner Avenue, Chicago 51, Illinois



Water, up hill and down dale, for a century or more

Terrain doesn't affect cast iron pipe performance.

This water supply line in Hagerstown, Maryland, for example, will carry the traffic load of an express highway. Yet, the officials of Hagerstown expect no major repairs or replacements in this line for a century or more.

- Cast iron pipe's rugged strength supports any normal load.
- The joints remain bottle-tight through severe pressures.
- The cement lining insures an uninterrupted full flow.
- Cast iron pipe does its job efficiently for as much as a hundred years or more.

CAST IRON PIPE

THE MARK OF PIPE THAT LASTS OVER 100 YEARS

CAST IRON PIPE RESEARCH ASSOCIATION

Thos. F. Wolfe, Managing Director, 3440 Prudential Plaza, Chicago 1, Illinois

Proved Cost Saver
CURE and SEAL CONCRETE WITH 1 PRODUCT

THOMPSON'S WATER SEAL

Eliminates wet sacks, papers, hosing and spraying

Spray deep penetrating, colorless Thompson's Water Seal on fresh concrete to cure and seal in one operation. Save time . . . save labor.

Effectively controls moisture loss for 28 days and beyond.

Assures uniform curing even in hot, dry weather.

Helps reduce checking, cracking, spalling.

Produces harder, dust-free surface.

Eliminates waterproofing concrete floors.

Permits adequate time for smooth troweling.

Send for technical bulletin and Contractors Case History file.

A proved bond breaker for pre-cast, tilt up and lift slab construction. Permits easy, clean separation of slabs, walls, pre-cast members.

Available in 5 and 55 gallon drums from building supply stores, paint and hardware dealers.

4932

Thompson's

MANUFACTURERS OF FINE PROTECTIVE CHEMICALS SINCE 1929

E. A. Thompson Co., Inc., Merchandise Mart, San Francisco 3, California

San Francisco • Los Angeles • San Diego • Portland • Chicago • Seattle • Denver • Dallas Houston • St. Louis • St. Paul • Detroit • Philadelphia • New York City • Memphis • Cleveland • Factory: King City, California

(Continued from page 113)

4.409 mi., Weed-Southeast toward Pinon, Federal Aid Proj. No. S-1201(2), Otero Co.;

N. M.—**O. D. Cowart Constr. Co.**, Bridge Blvd. S.W., Albuquerque, N. M., CA **$296,803**, est. $407,107, grade, base course, prime coat plant mix surf., approx. 5.571 mi., Pena Blanco-Cochiti, Fed. Aid Proj. No. S-1317(5), Sandoval Co.;

N. M.—**H. C. Jones**, Alameda, N. M., CA **$113,496**, est. $97,459, grade, 1 three span concrete, steel bridge, approx. 0.168 mi., Hernandez Bridge-Chama River, Fed. Aid Proj. No. S-1518(7), Rio Arriba Co. Grand total $2,398,394. BA 11/3/61. CD 10/18/61.

BUILDINGS—LB & CA

▲ **Jansen Constr. Co.**, P.O. Box 18628, Dallas, Tex., LB **$1,388,615**, (12 bidders), SCIENCE BLDG. ADDN., Arlington State College, ARLINGTON, TEX. Texas A & M College System, College Station, Arlington, Tex. BA 11/2/61. CD 9/11/61.

▲ **H. A. Lott, Inc.**, P.O. Box 2500t, Houston, Tex., LB **$1,660,000**, (Base), est. $3,750,000, 4 and 6 story, concrete frame, brick, Women's DORMITORIES, Projects 1 and 2, LUBBOCK, TEX. Texas Technological College, Lubbock, Tex. BA 10/31/61. CD 9/28/61.

▲ **Venus Constr. Co.**, 3100 Quary, Aurora, Colo., Owner Builds, **$3,000,000**, 180 one story, bsmnt. RESIDENCES, LITTLETON, COLO.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Calif., Los Angeles**—BA 12/15—Los Angeles County Flood Control Dist., 2250 Alcazar St., Proj. 428, Downey STORM DRAIN, Downey. $1,027,500. M. E. Salsbury, engr. CD 11/10/58.

BUILDINGS—BA

▲† **Idaho, Arco**—BA After 11/15—Atomic Energy Comn., Idaho Operations Office, Idaho Falls, 30,500 sq. ft. OFFICE, LABORATORY, first phase TECHNICAL SERVICE CENTER, National Reactor Testing Station, Central Facilities Area, Proj. AT (10-1)1109. $1,000,000. CD 8/1/60.

▲ **Ore., Portland**—BA 11/28—Portland Federal Savings & Loan Assn., 333 SW 5th Ave., (selected list of bidders), 6 story OFFICE. CD 6/21/56.

▲ **Calif., San Diego**—BA 11/30—Westgate California Corp., c/o Arnholt Smith, U. S. National Bank, 202 Broadway, Zone 1, (selected list bidders), 25 story, 438,000 sq. ft. structural steel, concrete U. S. National BANK and OFFICE, 2nd and Broadway. $10,000,000. Raymond Harry Ervin & Assoc., 1500 Denver Club Bldg., Denver, Colo., archts. CD 10/20/59.

▲ **Calif., La Jolla**—BA 12/1—Office Architects & Engineers, Bldg. T-8, University of California, San Diego at La Jolla, 4 story, totaling 70,000 sq. ft. rein.-con. BLDG. "C", University of California, San Diego at La Jolla. Plans deposit $300. Extended date. Risely & Gould, 250 West Third St., Los Angeles, archts. CD 10/31/61.

▲ **Calif., Riverside**—BA 12/7—Uuniversity of California at Riverside, two 4 story, 177,000 sq. ft. RESIDENCES. $4,100,000. George Vernon Russell, 410 N. Rosenell Terrace, Los Angeles, archt. CD 7/27/61.

▲ **Alaska, College**—BA 12/20—University of Alaska, rein.-con., steel frame GYMNASIUM, swimming pool. $1,600,000. Plans deposit $50. L. A. Forest, 622 Hemlock Way, Juneau, archt. CD 11/21/60.

HEAVY CONSTRUCTION—LB & CA

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, Bids opened 11/8, ROAD,

Miles-Sierra General Contractors, P.O. Box 859, Merced, Calif., LB **$2,989,667**, (5 bidders), grading, surf. 6.4 mi. four lane freeway, State Sign Rte. 198 near Lemoore Naval Air Station, Kings Co. CD 10/5/61.

▲† **Power City Constr. & Equipment Co.**, N. 2602 Hamilton St., Spokane, Wash., LB **$1,158,393**, (9 bidders), Keswick-Gas Point Road-Cottonwood 230-KILOVOLT TRANSMISSION LINE, Trinity River Div., Central Valley Proj. Spec. No. DC 5670, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Denver Federal Center, Denver, Colo. BA 11/2. CD 9/27/61.

▲ **Ben C. Gerwick**, 755 Sansome St., San Francisco, Calif., CA **$1,763,167**, WHARVES and PIERS, Sacramento Deep Water Port, West Sacramento, SACRAMENTO, CALIF. Sacramento-Yolo Port Dist., 703 California Fruit Bldg., 4 and J Sts., Sacramento, Calif. BA 10/31, CA 11/5. CD 11/2/61, under LB.

▲ **Fred J. Early Jr. Co.**, P.O. Box 114, Torrance, Calif., LB **$5,500,000** Identical Bid, SEWAGE TREATMENT PLANT, Point Loma, SAN DIEGO, CALIF. City, Rm. 161, Civic Center Bldg., San Diego 1, Calif. BA 11/8, CD 10/17/61;

F. E. Young & Morrison-Knudsen Co., P.O. Box 2872, San Diego, Calif., LB **$5,500,000**, Identical Bid, SEWAGE TREATMENT PLANT, Point Loma, (San Diego, Calif.).

▲ **Hood Corp.**, 8201 Sorenson Ave., Whittier, Calif., LB **$1,497,652**, est. $1,000,000, (11 bidders), Proj. 105, Calleguas Conduit, Unit 1, 5.88 mi. 48 in. WATER LINE, Burbank-Glendale, SOMIS, CALIF. Calleguas Municipal Water Dist., Box 183, Somis, Calif. BA 10/30. CD 10/11/61.

BUILDINGS—LB & CA

▲† **Fluor Corp., Ltd.**, 2500 Atlantic Blvd., Los Angeles, Calif., LB Total est. **$40,000,000**, ADVANCED TEST REACTOR, National Reacting Test Station, ARCO, IDAHO, Atomic Energy Comn., Idaho Operating Office, Idaho Falls, Idaho. Fluor proposal has been selected as basis for contract negotiation. Ebasco Services, Inc., 2 Rector St., New York, N.Y. and Babcock & Wilcox, 161 E. 42nd St., New York, N.Y., engrs.-archts.

▲ **Wadman Constr. Co.**, Box 1458 Ogden, Utah, LB **$1,182,806**, est. $1,200,000, (6 bidders), JUNIOR HIGH SCHOOL to be built in three phases, OGDEN, UTAH. Weber County School Dist., 1124 Washington Blvd., Ogden, Utah. BA 10/31/61. CD 10/23/61.

▲ **Berry Constr., Inc.**, 143 S. Granite Ave., Ontario, Calif., LB **$1,176,912**, est. $1,250,000, (7 bidders), Oak JUNIOR HIGH SCHOOL, Proj. 1, ANAHEIM, CALIF. Anaheim School Dist., 123 N. Citron St., Anaheim, Calif. BA 11/2. CD 10/24/61.

▲ **F. E. Young Constr. Co.**, P.O. Box 2872, San Diego 12, Calif., LB **$2,307,000**, (5 bidders), Samuel F. B. Morse HIGH SCHOOL, 69 and Skyline Dr., SAN DIEGO, CALIF. San Diego Unified School Dist., 4100 Normal Blvd., San Diego 3, Calif. BA 11/7. CD 10/19/61.

▲ **Pardee Bldg. Co.**, 10639 Santa Monica Blvd., Los Angeles 25, Calif., CA **$1,118,375**, 114 RESIDENCES and GARAGES, Clairemont Mesa Unit No. 1, SAN DIEGO, CALIF. Francisco Bldg. Co., 10639 Santa Monica Blvd., Los Angeles 25, Calif.

▲ **Merco Inc.**, 1704 Ruxton Lane, Redondo Beach, Calif., CA **$2,667,880**, 150,128 sq. ft. Ernest Righetti HIGH SCHOOL, SANTA MARIA, CALIF. Santa Maria High School Dist., 901 S. Broadway, Santa Maria, Calif. H. L. Gogerty, 3123 W. 8 St., Los Angeles, Calif., archt. Thomas C. Beggs, 633 E. Main St., Santa Maria, Calif., engr. BA 10/26, CA 10/31. CD 7/26/61.

▲ **L. A. Dixon Co.**, 409 S. California St., San Gabriel, Calif., CA **$6,052,000**, PROCESSING PLANT, east side Golden State Hy., SELMA, CALIF. Sun Maid Raisin Growers of California, 2902 Hamilton Ave., Fresno, Calif. BA 10/26. CD 10/10/61.

CANADA

HEAVY CONSTRUCTION—BA

▲ **Ont., Port Credit**—BA 12/13—Dpt. P. Wks., Sir Charles Tupper Bldg., Riverside Dr., Ottawa, HARBOR IMPRVS., incl. harbor extension, dredging, 1,000 ft. breakwater. Total est. $2,500,000. Plans deposit $100. CD 10/17/61.

BUILDINGS—BA

▲ **Ont., Toronto**—BA 12/15—The T. Eaton Co., Ltd., 190 Yonge St., DEPARTMENT STORE, Yorkdale Shopping Center, Hy. 401 and Dufferin St. $1,000,000-$2,000,000. John Graham Consultants, 2 Carlton St., engrs. CD 3/6/61.

BUILDINGS—LB & CA

▲ **Louis Donolo (Ontario) Ltd.**, 2790 Dufferin St., Toronto, Ont., CA Est. $1,500,000, 86,000 sq. ft. SHOPPING CENTRE, Huron and Highbury Ave., LONDON, ONT. Toronto Industrial Leaseholds (1957) Ltd., 12 Sheppard St., Toronto, Ont. CD 1/3/60.

▲ **Dell Constr. Co., Ltd.**, 2453 Bloor St. W., Toronto, Ont. CA Est. **$2,000,000**, (12 bidders), rein.-con. frame, aluminum-glass HOSPITAL ADDNS., OAKVILLE, ONT. Oakville-Trafalgar Memorial Hospital Bd., Oakville, Ont. BA 10/3/61. CD 9/14/61.

▲ **Bellevue Estates**, 6900 Cote des Neiges Rd., Montreal, Que., Owner Builds, **$1,261,000**, brick HOUSING, concrete fndns., ILE PERROT, QUE.

▲ **J. H. Dupuis Ltee**, 3333 Viau St., Montreal, Que., CA Est. **$1,500,000**, 2 story concrete APPRENTICE TRAINING CULTURAL CENTER BLDG., Parthenais St., MONTREAL, QUE. Montreal Building Trades Apprentice Training Comn., 5205 Parthenais St., Montreal, Que. BA 10/30/61. CD 10/24/61.

▲ **Pigott Constr. Co., Ltd.**, 1600 Dorchester Blvd. W., Montreal, Que., CA Est. **$40,000,000**, 48 in. wide stainless steel strips producing STEEL MILL, TRACY, QUE. Atlas Steele Ltd., Centre St., Welland, Ont. Surveyer, Nenninger & Chenevert, 1440 St. Catherine St., Montreal, Que., engrs. CD 11/1/61.

▲ **Canada Car Div. A. V. Roe Canada Ltd.**, 170 University Ave., Toronto, Ont., LB **$822,446**, 95 TRANSPORTABLE HOMES, STORAGE UNITS, Yorkton, Sask.; LB **$834,886**, 95 TRANSPORTABLE HOMES, STORAGE UNITS, Dana, Sask.; LB **$797,587**, 95 TRANSPORTABLE HOMES, STORAGE UNITS, Gypsumville, Man., SASKATCHEWAN and MANITOBA, Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. BA 10/26/61, CD 10/16/61;

Estevan Industries Ltd., Calgary, Alta., LB **$851,672**, 95 TRANSPORTABLE HOMES, STORAGE UNITS, Alaska, Sask. (Saskatchewan and Manitoba).

Klassen Constr. Co., Ltd., 3525 Avonhurst Dr., Regina, Sask., LB **$3,139,900**, aggregate, supply and install 380 TRANSPORTABLE HOMES, STORAGE UNITS, Gypsumville, Man., Alaska, Yorkton and Dana, Sask. (Saskatchewan and Manitoba).

LATIN AMERICA

BUILDINGS—BA

▲ **Argentina**—BA 3/28—Agua y Energia Electrica, Sala de Licataciones, LaValle 1554, Buenos Aires, enlarging Sorrento THERMOELECTRIC PLANT and constr. Rosario Norte TRANSFORMER STATION, Santa Fe Province, Tender No. 125/61. $4,000,000.

BUILDINGS—LB & CA

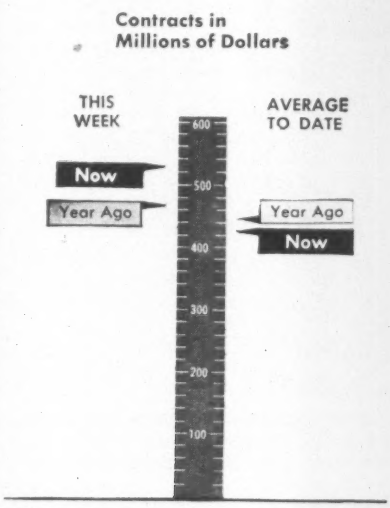
▲ **Tovato y Cia**, Buenos Aires, Argentina, CA Est. **$5,000,000**, AXLE PLANT near here, BUENOS AIRES, ARGENTINA. Eaton Ejes, subsidiary Eaton Axle Co., 739 E. 140 St., Cleveland, O., S.A.I.C. Parana 851, Buenos Aires, Argentina. Sanchez Elia, Peralta Ramos, Agostini, Buenos Aires, Argentina, archts. CD 4/6/61.

For additional reports see CONSTRUCTION DAILY, REPORTS SECTION

(Proposal Advertisements see pp. 125 to 127)

Construction Scoreboard

This Week . . .



AMOUNT OF CONTRACTS LET

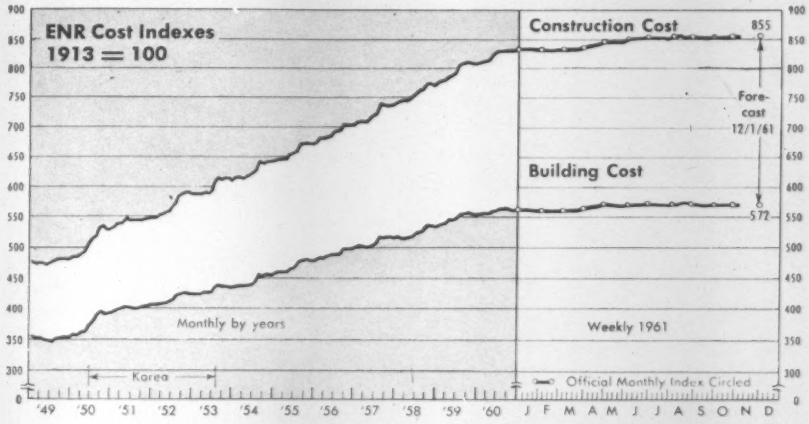
Contracts Awarded In 50 States By Type	This Week	Cum. 46 wks 1961	Chge '60-'61 %
	millions		
All Heavy Construction	$533.7	$19,875.1	− 1
By Ownership			
PRIVATE	250.6	9,850.7	− 8
PUBLIC	283.1	10,024.4	+ 6
State & Municipal	256.8	7,900.4	+ 7
Federal	26.3	2,124.0	+ 3
By Type of Work			
PUBLIC			
Waterworks	17.0	361.6	−13
Sewerage	19.5	734.3	+37
Bridges*	26.4	592.5	−18
Highways	89.2	3,371.9	+12
Earthwork, Dams & Waterways	18.1	729.1	+ 8
Buildings:			
Excl. Housing	55.2	2,344.3	+ 5
Housing	13.0	739.1	+18
Unclassified	44.8	1,151.7	− 9
PRIVATE			
Buildings:			
Mass Housing	130.1	4,609.6	− 9
Commercial	33.6	2,304.9	+ 4
Industrial	75.3	2,534.9	+ 4
Unclassified	11.5	400.6	−58

*Includes Private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of Nov. 9	Cum. 45 wks 1961	Chge '60-'61 %
	millions		
Corporate Securities	60.0	$3,127.6	− 6
State & Municipal:			
All Except Housing	173.2	5,867.8	+ 5
Housing	1.4	121.7	−36
Federal Loans	24.1	227.1	+37
Federal Aid	0	3,535.7	+10
Total Nonfederal	$258.7	$12,879.9	+ 3
Federal Appropriations:			
Projects in U. S.	0	3,448.1	+ 9
Outside U. S.	0	145.3	− 9
Total New Capital	$258.7	$16,473.3	+ 4


ENR Cost Indexes
1913 = 100
Construction Cost
855
Forecast 12/1/61
Building Cost
572
Monthly by years
Weekly 1961
Korea
Official Monthly Index Circled
'49 '50 '51 '52 '53 '54 '55 '56 '57 '58 '59 '60 J F M A M J J A S O N D

ENR INDEXES (1913 = 100) 20-cities' average	Week of Nov. 9 1961	% Change from Oct. 5 1961	% Change from Nov. 10 1960
Construction Cost	855.57	+0.2	+3.1
Building Cost	570.99	+0.1	+1.8

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.858.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

Latest Month . . .

ENR COST INDEXES IN 22 CITIES, 1913 = 100

City	Construction Cost Nov. 1961	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost Nov. 1961	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	647.77	0	+0.1	504.20	0	+1.1
Baltimore	747.48	0	−1.0	555.16	0	−1.0
Birmingham	699.31	0	+6.9	540.75	0	+2.8
Boston	885.68	+0.4	+5.7	594.92	+0.6	+4.2
Chicago	946.20	+0.1	+3.5	593.64	+0.2	+0.7
Cincinnati	864.74	+0.3	+3.0	558.59	+0.4	+1.6
Cleveland	975.03	−0.3	+3.2	572.44	−0.5	+1.9
Dallas	659.60	−0.2	+3.2	530.33	−0.2	+1.3
Denver	776.87	0	+2.7	560.43	+0.4	+1.5
Detroit	983.42	−0.1	+2.1	613.69	−0.2	+1.4
Kansas City	837.88	0	+3.1	561.98	0	+1.6
Los Angeles	939.85	0	+4.4	579.18	0	+3.2
Minneapolis	912.84	0	+3.2	586.65	0	+1.9
New Orleans	671.02	+0.4	+5.4	519.03	+0.7	+2.9
New York	1,071.32	+0.1	+3.4	663.66	+0.2	+2.7
Philadelphia	846.24	+0.7	+1.9	591.21	+1.0	+0.2
Pittsburgh	916.54	+0.3	+3.5	634.14	0	+2.1
St. Louis	913.62	−0.2	+1.5	581.41	+0.1	+0.9
San Francisco	910.46	0	+3.9	564.25	0	+1.9
Seattle	887.25	0	+4.0	518.77	0	+3.0
U. S.—20 Cities' avg.	**855.57**	**+0.2**	**+3.1**	**570.99**	**+0.1**	**+1.8**
Montreal	660.99	+3.1	+1.9	463.51	+1.5	−0.3
Toronto	701.17	+0.2	+1.6	497.88	+1.2	+1.2

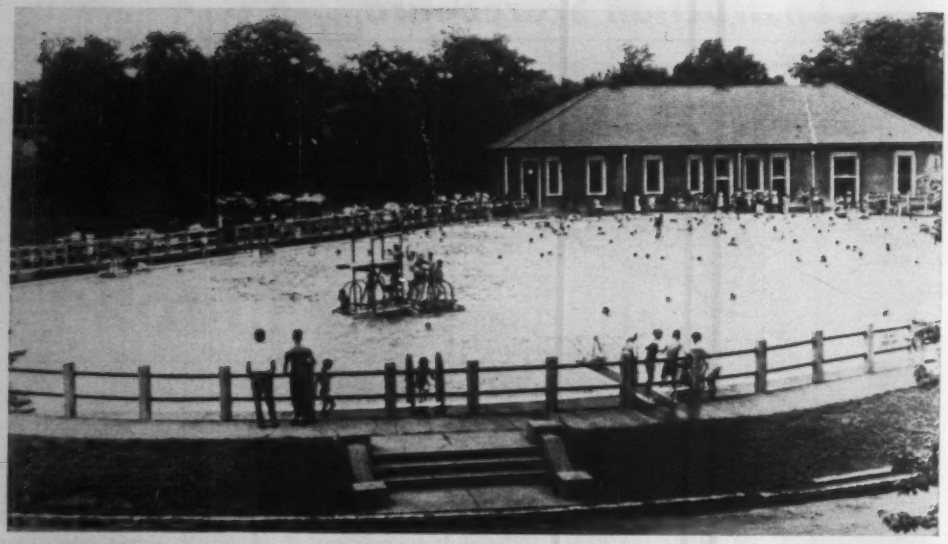
CONTRACTS AWARDED

	1961 Oct. (millions)	1961 10-Mos. (millions)	Percent Change from 1960 Oct.	Percent Change from 1960 10-Mos.
Total U. S. (ENR reported)	$1,869	$18,559	+ 4	− 2
Private	990	9,136	−10	−10
Public	879	9,423	+26	+ 7
State and Municipal	761	7,393	+27	+ 7
Federal	118	2,030	+22	+ 5
ENR Volume Index, 1913 = 100	628	575	+ 1	− 3

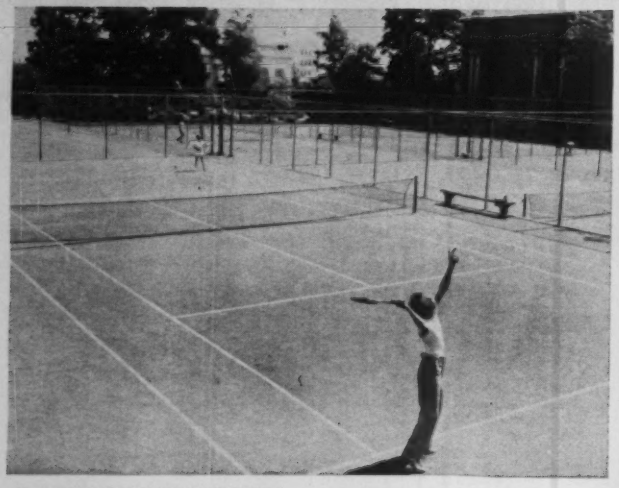
NEW CONSTRUCTION CAPITAL

Total U. S.	1,303	15,854	−44	+ 2
State and Municipal Bond Sales	552	5,696	+33	+ 1
Corporate Security Sales	471	2,999	−39	− 4
Federal Loans, Aid (nonfederal work)	81	3,738	−84	+10
Federal Appropriations,* (federal work)	198	3,421	−68	+ 3

* Includes funds for outside U. S.



ASPHALT SWIMMING POOLS provide large swimming areas at low cost. Their excellent weathering qualities are based on asphalt's resistance to pressure, freeze-thaw, chlorine, and abrasion. Asphalt wading pools serve equally well as skating rinks.



ALL-SEASON TENNIS COURTS paved with asphalt are fast, true, unaffected by frost, and can be played on immediately after rain.

RESILIENT PLAYGROUND PAVING of asphalt answers the need for a smooth, hard surface which can be used year-round in all kinds of weather. Fewer injuries occur on asphalt than on untreated earth or loose aggregates. Maintenance is negligible.

ASPHALT FROM ESSO OPENS THE WAY TO LOW-COST RECREATION

Asphalt from Esso gives motorists a smooth, comfortable ride on many of the nation's best roads. It also plays a big part in meeting the growing need for recreational facilities. In both fields, asphalt is saving money for taxpayers.

Esso refines asphalt in a wide range of grades to suit a variety of recreational and other purposes; delivers it from nine conveniently located supply points so you can always get prompt deliveries. For technical information about this economical and versatile material, write us at 15 West 51st Street, New York 19, New York.

HUMBLE OIL & REFINING COMPANY

Labor Gives Nuclear Plant a Good Start

AFL–CIO building and construction trades workers, and union officials at both the local and international levels, are being given considerable credit for the swift, peaceful and economical construction of Yankee Atomic Electric Co.'s new 136,000-kw nuclear power plant on the Deerfield River in Rowe, Mass.

Earlier this month, Fred R. Stevens, vice president of Stone & Webster Engineering Corp. told members and guests of the National Joint Board for the settlement of Jurisdictional Disputes that the complex and experimental project experienced no labor problems of any kind and was completed two months ahead of schedule at a cost of about $13 million under original estimates.

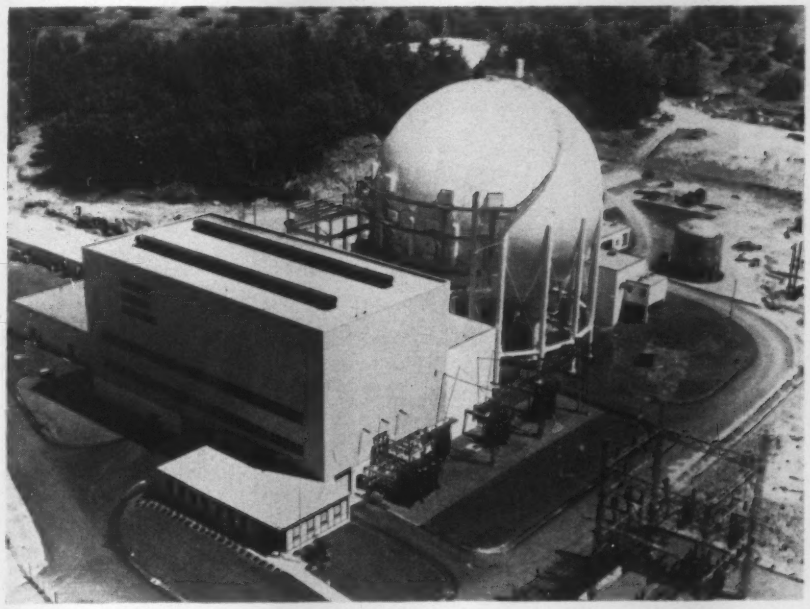
The company claims that this is the first time in history that a project of this kind has achieved such a record. An official of the Atomic Energy Commission calls it an "extraordinary success."

Stone & Webster and Westinghouse Electric Corp. were jointly responsible for Yankee's engineering design. Stone & Webster was solely responsible for the plant's construction. Yankee Atomic Electric, the owner, represents 10 New England utility companies and now holds a 40-year AEC license to operate the pressurized water reactor.

The project's enviable labor record is generally attributed to two factors that have been noticeably absent in the nation's still-troubled missile site program. One was centralization of complete authority in a single participant–Stone & Webster–to direct the work and to make day-to-day decisions. The other was labor's thorough introduction, before construction began, to the project's complexities and challenges through the most comprehensive pre-job conference Stone & Webster has ever held (ENR Apr. 3, 1958, p. 114).

By the time the excavation work was started, all the unions that would be furnishing the men for the project were generally familiar with the plant's design and its construction problems, with its labor requirements and its progress schedules and with Stone & Webster's expectations, labor policies and methods of operation.

All of the foreseeable problems that might be generated by local labor contracts, national agreements, work assignments, jurisdictional conflicts and labor recruiting were discussed, explored and ironed out ahead of time.



YANKEE PROJECT was completed ahead of schedule without disputes or stoppages.

This kind of teamwork in the project's early stages produced a beneficial labor-management rapport–what Stone & Webster Personnel Manager Vincent Van Horn calls a "communications system that helps assure cooperation." And, most important of all perhaps, it helped give the Yankee construction workers a better understanding of the project's overriding challenge of reducing the cost gap between power produced by nuclear energy and that produced by fossil fuels.

The project's labor force reached its peak of about 585 men in September 1959. All told, members of 15 different crafts–with pipefitters, laborers, carpenters, electrical workers, boilermakers and iron workers the most heavily represented–performed 1,250,000 man-hours of construction work.

Even a quick glance at the Yankee system, for which Stone & Webster prepared nearly 1,000 drawings and 50,000 blueprints, gives some idea of the demands made on labor.

The heart of the plant is a 125-ft spherical steel vapor container housing the reactor and primary system that replaces the conventional boiler. It is here that 3.4 million uranium pellets in 23,000, eight-ft stainless steel tubes produce the nuclear fission that heats the water, pressurized to 2,000 psi, to provide the heat that generates the steam that later drives the turbine generator. The base for the reactor structure required one of the largest continuous concrete foundation placements ever used for a powerhouse.

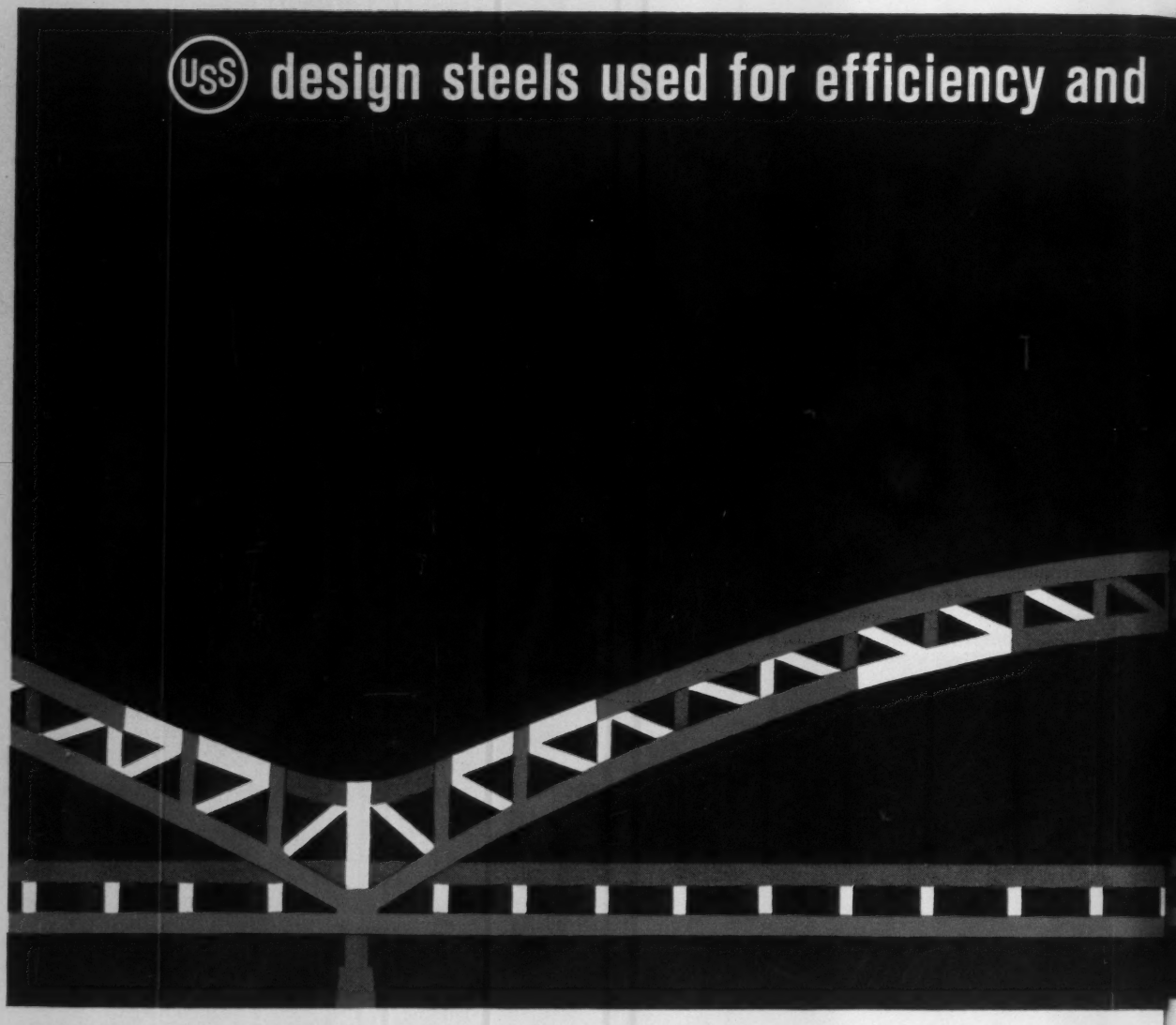
The primary system is tied into a number of intricate auxiliary systems designed to eliminate danger of radioactive contamination.

From the beginning of the project to its completion, there was no shortage of necessary skills. No on-the-job training was required. No labor disputes materialized. The only flaw in an excellent record, according to Mr. Van Horn was insignificant and "accidental"–a fleeting work stoppage by one of the local trades that was engaged elsewhere in a local collective bargaining dispute.

Company spokesmen describe labor's response to the project's demands as "extremely satisfactory" and its cooperation as "complete." Without these, they say, the reactor could not have "gone critical" at 8:19 pm on Aug. 19, 1960–two months ahead of schedule.

Stone & Webster, in cooperation with Westinghouse and Yankee Atomic Electric, has recorded the project's drama, achievements and challenges in a prize-winning film entitled "Pioneering With Power." The film is now being shown to interested groups around the country and abroad.

USS design steels used for efficiency and



Sketch of one span of the two-span bridge showing where it was most efficient to take advantage of the high yield strength provided by steels such as USS "T-1" Steel (in red), USS TRI-TEN High-Strength Low-Alloy Steel (in white), A7 and A373 Structural Carbon Steel (in gray). Louisville-New Albany Bridge

The new double-deck, two-span, tied-arch bridge spanning the Ohio River between Louisville, Kentucky, and New Albany, Indiana, should be extremely interesting to bridge designers and engineers.

Designed by the consulting firm of Hazelet & Erdal, this bridge is another fine example of the application of heat-treated constructional alloy steel, high-strength low-alloy and structural carbon steels to provide the desired strength at the least weight and lowest cost. A total of 7,641 tons of steel were used in the two 800-foot spans and the approaches.

Because much of this bridge was shop welded, the excellent welding properties of USS Design Steels played an important part in their selection. The weldable, constructional alloy USS "T-1" and high strength TRI-TEN Steels both permitted the design engineers to obtain considerable savings in the amount of steel needed, resulting in a substantial reduction in the total cost of the structure. The saving in steel tonnage reduced dead weight enough to effect still further savings by reduced loads on individual truss members, piers, and foundations.

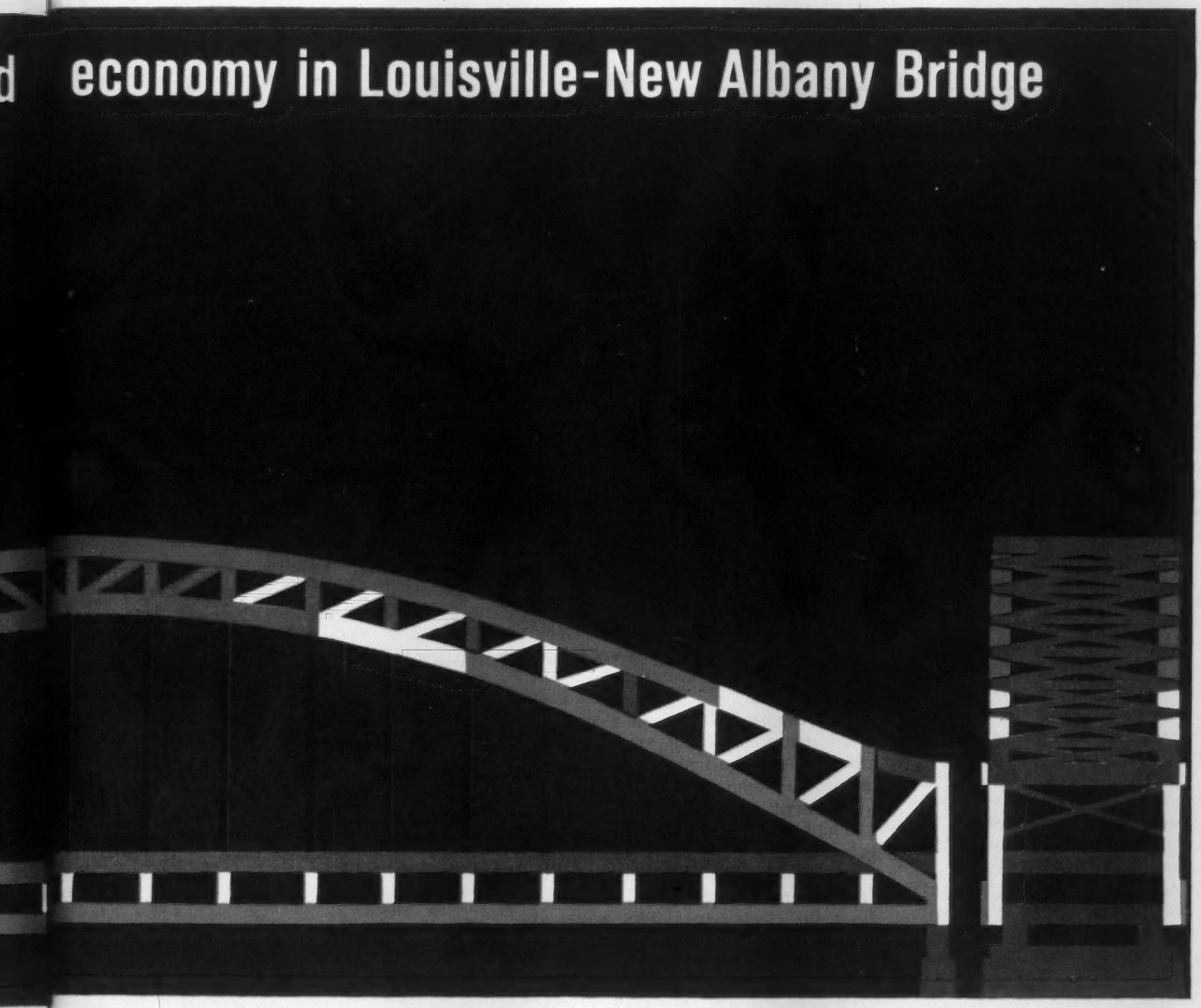
All of the tie and most of the highly stressed upper and lower chords and some verticals were made of 100,000 psi yield strength heat-treated constructional alloy steel. Approximately 1,500 tons of USS "T-1" Constructional Alloy Steel were used.

Most of the diagonals, some of the top and bottom chords and approach trusses called for 50,000 psi high-strength low-alloy ASTM A242 steel. USS TRI-TEN Steel—1,535 tons of it—was used for these applications. (USS TRI-TEN Steel can also meet specification ASTM A441.)

United States Steel also furnished 1,100 tons of ASTM A373 and 1,550 tons of ASTM A7 structural carbon steel, used in the lesser stressed members of the bridge and approaches.

This mark tells you a product is made of modern, dependable Steel

economy in Louisville-New Albany Bridge



was designed by Hazelet & Erdal, Consulting Engineers, Louisville, Kentucky, for the State Highway Department of Indiana and Kentucky Department of Highways. Fabricator: The R. C. Mahon Co., Detroit, Michigan. Erector: John F. Beasley Construction Co., Dallas, Texas (Sub-contractor to Mahon).

Two other USS High Strength Steels have been widely used for bridges—USS MAN-TEN ASTM A440 and USS COR-TEN Steels. Both have a 50,000 psi minimum yield point. USS COR-TEN Steel offers outstanding resistance to atmospheric corrosion and superior paint adherence qualities. It is a natural choice for riveted structures in corrosive areas. USS MAN-TEN ASTM A440 Steel is the lowest priced of our High Strength Steels and is generally used for riveted structures. Recently introduced, USS "T-1" Type A Steel is the newest member of our famous family of constructional alloy steels and offers, at the same strength level as "T-1" Steel, a more economical grade for applications 1" thick and under. For more information on any of these USS Design Steels, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS, "T-1", COR-TEN, TRI-TEN and MAN-TEN are registered trademarks

USS Steels for bridge design

	PSI Min. yield
Structural Carbon Steel (A373)	32,000
Structural Carbon Steel (A7)	33,000
Structural Carbon Steel (A36)	36,000
USS COR-TEN High Strength Steel	50,000
USS MAN-TEN (A440) High Strength Steel	50,000
USS TRI-TEN (A441) High Strength Steel	50,000
USS "T-1" Constructional Alloy Steel	100,000

United States Steel Corporation, Pittsburgh • Columbia-Geneva Steel, San Francisco • National Tube, Pittsburgh • Tennessee Coal & Iron, Fairfield, Alabama • United States Steel Supply, Steel Service Centers United States Steel Export Company

USS United States Steel

High Court Approves Wage-Hour Curb

The U.S. Supreme Court last week gave employers in the construction industry some protection against indiscriminate application of the Fair Labor Standards Act (better known as the federal minimum wage law).

With three justices dissenting, the Court refused to review an Eighth Circuit Court of Appeals decision that curbed Labor Department efforts to extend the reach of the law. The Department had been encouraged to broaden its enforcement of the law by a series of Supreme Court decisions.

As the matter now stands, contractors who still come under the law as it stood before the 1961 amendments can place some reliance on the views of the lower court, which said:

- There is "no precise formula or hard and fast rule" for determining whether workers are "engaged in commerce or in the production of goods for commerce"—a situation that brings them within the law's protection.
- The law's coverage is not as broad as Congress could have made it. It does not automatically cover all work or all construction work—even when the latter occurs on a project that is in interstate commerce. Congress clearly left outside the law various activities that may in some way affect commerce.
- The test of the law's coverage is the character of the employee's activity, not the activity of the employer.
- Each situation must turn on its own facts. The line that determines coverage must, in many cases, be finely drawn.

The case is one that arose on the Table Rock Dam and Reservoir project on the White River in Arkansas and Missouri.

The Labor Department claimed that one of the contractors (Wade Lahar Construction Co.), which held contracts for clearing part of the land above the dam, had violated the minimum wage, overtime and record-keeping provisions of the law. Because the bi-state project was for a multiple purpose (flood control, navigation, electric power and recreation) and because it was paid for by federal funds, the Department reasoned, all work on the project was, for all practical purposes, "in commerce" and covered by the law.

In rejecting this argument, the lower court said the nature of the project as a whole was not determinative. It looked, instead, at the nature of the work performed by the employees in question and found it "local" in nature and for "recreational" purposes, putting it beyond the scope of the federal law.

The work, the Court said, was not performed at the dam or at the damsite, was not directed toward improvement of navigation or protection of the dam itself, and was not directly or vitally related to commerce.

There must be a cut-off point somewhere, the Court observed, even though a "decision in this kind of case is, after all, perhaps only a question of touch and tone."

The 1961 amendments to the Fair Labor Standards Act do not affect the decision. The amendments simply add a new and additional coverage test by extending the law to all employees of "in commerce" construction enterprises that do $350,000 worth of business a year (ENR Aug. 31, p. 66).

Average Wage Scale Hits $3.83

The average hourly wage scales of union building trades workers has climbed to $3.83, according to the U.S. Department of Labor. The present level is 85% above the 1947-49 average and 4% higher than that of a year ago.

In its third quarter report on union construction wages, the Labor Department said that the average wage increase for the year ended October 2 was 14.7 cents an hour.

The report is based on a survey of seven major building trades in 100 cities. The wage scales do not include overtime, premium pay or fringe benefit payments.

The Department found that the wage gains over the year varied by trade and ranged from a low of 9.4 cents an hour for plasterers to a high of 18.4 cents an hour for electricians. The trades surveyed are shown in the accompanying table, together with their 12-month gains and their current average wage scales.

The report indicates that union wages have, on the average, risen a little more this year than they did last year. In its last year's third quarter report, the Department put the 12-month gain (October 1, 1959-October 1, 1960) for all trades at 13.8 cents an hour.

Trade	*Increase since* Oct. 3, 1960 (cents)	*Average wage scale on* Oct. 2, 1961
Bricklayers	15.6	$4.34
Carpenters	14.8	3.94
Electricians	18.4	4.23
Painters	12.5	3.69
Plasterers	9.4	4.18
Plumbers	15.5	4.17
Building laborers	13.8	2.95
All trades	14.7	3.83

Labor in Brief . . .

- **Bonding fees**—Surety companies have cut in half (from 50% to 25%) the surcharge for covering bonded union employees under the Landrum-Griffin Act, since no claims have been filed, according to AFL-CIO President Meany. The law's addition of "faithful discharge" of duties to the customary surety bond safeguards against theft and embezzlement had resulted in "unwarranted" bonding costs, Mr. Meany said.

- **Prevailing wages**—The U.S. Labor Department has clarified an earlier decision to suspend application of the Davis-Bacon Act to truckers who are owner-operators (ENR Nov. 2, p. 94). The Department's solicitor says the suspension applies only to "various types of hauling equipment"—not to "bulldozers, scrapers, backhoes, cranes, drilling rigs, etc."

- **Welding**—The bricklayers union has reminded its members that the welding torch is a tool of the trade under the "Green Book" and the "Ten Commandments." It has urged all its local unions to include welding in their apprentice programs and to get those who complete the course to be certified as welders. Use of precast and fabricated panels of masonry materials gives the matter a sense of extreme urgency, the union says.

- **"Stop strikes"**—The Building Contractors Association of New Jersey, through its Managing Director Paul J. Brienza, recently urged the newly merged New Jersey AFL-CIO to demonstrate labor's maturity by undertaking a "crash-study" to find a way to eliminate strikes in the state. Public intolerance is mounting Mr. Brienza warned.

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Change-Order Headaches Will

Change orders without time extensions will become standard practice on missile and space-probe projects in this decade, a 650-man Washington conference on U. S. government construction contracts heard last week.

But construction contractors will be able to survive this shattering prospect, official spokesmen predicted, with the help of improved procedures now in the making to speed the processing and payment of claims.

Lt. Gen Walter K. Wilson, Jr., Army Chief of Engineers, evaluated the onrushing tidal wave of high-pressure jobs in broad outline.

Man-on-the-Moon and space-probe projects already are breaking ground for initial facilities of programs that will surpass all missile base experience to date in size and complexity.

These jobs, together with highly sophisticated facilities for missiles and missile killers, will aggravate the problem—familiar to builders of missile bases—of converting fluid designs to rigid structures under deadline schedules that permit no time extensions.

Something has to be done about the mounting burden before construction contractors break under the load, General Wilson warned. The contractor is indispensable, he emphasized. Without the services and cooperation of active, healthy construction companies on ground facilities, the federal agencies and their rocket suppliers could never launch a missile or space vehicle on the target dates required by their tight schedules, he said.

Something is being done, the Engineer Chief noted, in improving procedures and making the headquarters offices more accessible to contractors on missile bases and fast-developing projects for the National Aeronautics and Space Administration. The Corps will contract $200 million for NASA this year on Moon-shot and spaceflight facilities, a program that General Wilson foresees developing into at least $500 million a year of construction.

The main responsibility for easing the strain on missile and space jobs still rests with the contractor, he noted. The solution as he sees it lies in advance agreements in two areas: one between the general contractor and the contracting officer (including the latter's representative on the site), the other between the prime contractor and each of his subcontractors.

In both areas the conferees must come to complete face-to-face agreement and understanding on the handling of difficulties that are bound to arise, particularly on design changes, joint occupancy conflicts and jurisdictional disputes.

Lt. Gen. Walter K. Wilson, Jr.
Shattering news for contractors.

Advance understandings on these trouble spots will enable the contractor and the contracting officer to talk out their differences in the field as difficulties arise, thus reducing the number of claims to be fought through the Appeals Board and the courts, General Wilson suggested.

The prime contractor is the key to the problem, he declared. Specifically, the general contractor must set up the machinery to work out difficulties between himself and his subcontractors. Much has been done to speed the settling of claims. More can be done by settlement between the prime contractor and subcontractors.

Prime contractors will have to continue living with these thorny problems, General Wilson warned, despite the progress made on improved procedures between the Corps of Engineers Ballistic Missile Construction Office and the builders of ICBM bases.

"I hope some of the contractors are left so we can use them again," he added, referring to upcoming NASA projects. Prequalification of bidders will continue to be necessary for much of the NASA construction, the Engineer Chief predicted. Using design criteria furnished by NASA, the Corps will supervise architect-engineer contracts for design and prime contracts for construction in accord with the established procedures already in effect.

"Construction has a unique role in space," General Wilson said. "To handle designs (and design changes) coming from the engineer, the contractor must be geared to handle the transition. We must prequalify contractors in order to get the best, to the advantage of the most. With competitive bidding, prequalification will assure that NASA construction will be carried out by the lowest qualified bidder."

Col. Carlin H. Whitesell, Deputy Commander of CEBMCO and contracting officer in charge of the six Titan I bases, offered many of the same suggestions in a panel discussion of delays and acceleration in contract performance. Addressing himself to techniques of negotiating equitable adjustments, Colonel Whitesell noted that he had received 158 claims from his prime contractors for adjustments that have boosted the estimated cost of the six Titan I bases by 36% from a contract total of $216 million to a current figure of $293 million.

Concurrency and joint occupancy of Titan launching and liquid-fuel loading facilities by the construction contractor and the missile maker add to the difficulty and cost of telescoping design changes into the fixed time schedule on the electrical-mechanical phase of the work. It is this stage that produces most of the claims.

Design changes under these conditions force a contractor to make up lost time by using more men and working more hours than is efficient. The government must recognize the cost of this inefficiency, Colonel Whitesell said, but the task of calculating the ripple effect upon trades beyond the craftsmen immediately involved is almost impossible.

To give the contracting officer a base for negotiation on added costs, the government has established joint occupancy factors for Titan I that range from moderate to severe and may amount to six hours effective work in an eight-hour shift. The government also has a standard of overtime inefficiency due to long hours that run over 48 but no more than 60 hours per week.

Shortage of labor is a complicating factor at all bases, often related to conditions beyond contractor control, such as lack of local housing for workers, requiring 60-mile daily trips to and

Intensify

from the job, the Titan director said.

All increased costs of change orders must be recognized, he declared, including premium prices for materials, the loss of sequence and disruption of schedules that wreck planned construction procedures. A higher allowance must be made for overhead, Colonel Whitesell said, above the 10% ceiling allowable during normal peak placement of work. But the larger allowance due under changes in the contract can be determined only by audit, he added.

It is urgent, CEBMCO's deputy commander said, that the government and the contractor price the increased cost of changes as early as possible so that the government can make progress payments.

Despite the many difficulties of the initial learning period on ICBM construction, Colonel Whitesell noted that satisfactory adjustments have been worked out between the construction contractor and the government on the $125-million missile job for the first two Titan I squadrons, now in place at Lowry Air Force Base, Cheyenne, Wyo. For this installation, every claim has been settled except two by the missile supplier.

Professional Men Plan State-Wide Association

A new New York State Association of the Professions, now writing its constitution and by-laws, will study and act on economic, political, social and public relation problems affecting the professions.

Affiliated groups include professional engineers, architects, doctors, dentists, veterinarians and pharmacists. More are expected to join.

The association hopes to develop professional people as "molders of public policy," according to Dr. Henry Fineberg, chairman pro-tem, and Jack Pardee, secretary-treasurer pro-tem. Dr. Fineberg is executive vice president of the Medical Society of the State of New York. The new organization will speak for and against state legislation affecting all professional groups. It will not, however, be a political group; it will serve as a bi-partisan communications medium.

Other activities of the association will include public relations, education and business services and techniques.

The constitution of the NYAP will be modeled after the Michigan Association of the Professions, incorporated in 1958. The MAP has 3,500 members —more than 10% of the professional organizations it represents.

Tollroads Near Construction

Turnpike projects nudged into prominence in recent days in two sections of the country.

Oklahoma's Turnpike Authority sold a $56.5-million issue earlier this month, which will help finance construction of a 135-mile, limited-access route from the Turner Turnpike in Oklahoma City to the Red River, north of Wichita Falls, Tex.

And during the week of December 4, Florida State Turnpike Authority will offer $155 million worth of revenue bonds. The new issue will provide both money for new construction and also refunding.

The Authority plans to retire an outstanding series of 1955 bonds that financed the Sunshine State Parkway. About $64 million of the issue were outstanding November 1.

The remaining $91 million from the proposed issue will pay for construction of an extension to the existing Sunshine State Parkway. The extension to the existing turnpike will run about 159 miles in a northerly direction via Orlando to a point near Wildwood.

Officials estimate that construction of the Sunshine Parkway extension will be completed and open to traffic by Nov. 1, 1963.

Experts Spread Cheer Among Homebuilders

Construction experts now generally agree that the housing market next year will show improvement over this year. They only differ on the degree of improvement.

Fred A. Manske, president of National Gypsum Co. says starts next year will rise about 4% above this year's expected 1.3 million units.

Walter E. Hoadley, vice president and treasurer of Armstrong Cork Co. predicts a 2% to 5% rise. Kenneth G. Heisler, managing director of the National League of Insured Savings Associations says starts will bounce 12% to 1.45 million units. And ENR's economist, James Webber says housing contracts next year will top this year's volume of $5.1 billion by 4% (ENR Sept. 7, p. 19).

OFFICIAL PROPOSALS

Bids: November 28, 1961

Richmond Tunnel
Contract 500

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York 5, New York, until 11:00 A.M., Eastern Standard Time on Tuesday, November 28, 1961, for Contract 500, for the construction of the Richmond tunnel, together with its shafts and appurtenant work. The tunnel, approximately 25,000 feet long, will cross Upper New York Bay and will extend from a shaft in Brooklyn, New York, approximately 925 feet deep, to a shaft in Richmond, New York, approximately 965 feet deep.

Pamphlets of the contract can be obtained in the Secretary's office, Room 1312, at the above address, upon application in person or by mail, by depositing the sum of $10.00 for each pamphlet. There will be a charge of $1.25 to cover mailing costs for each set of contract pamphlets requested. Blueprints of the contract drawings will be furnished at a charge of $3.10. For further particulars, apply at the office of the Chief Engineer at the above address.

ARTHUR C. FORD, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners: Board of Water Supply; MARTIN T. GERAGHTY, Chief Clerk.

District of Columbia—Building Construction—October 31, 1961. CONSTRUCTION OF DOCTORS' RESIDENCE, D. C. GENERAL HOSPITAL, 19th and C Streets, S.E., Washington, D. C. (Invitation No. C-6275-B). Bid forms, plans and specifications are now available from Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $100.00 per set, payable to D. C. Treasurer. (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EST, November 30, 1961, in Room 424, 499 Penn. Ave., N.W.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5700) will be received at Dutch John, Utah, until 2 p.m., Mountain Standard Time, January 11, 1962, for furnishing labor and materials for Completion of Flaming Gorge Powerplant and Switchyard, Flaming Gorge Unit, Utah-Wyoming, Green Division, Colorado River Storage Project. Location 45 miles north of Vernal, Utah. Principal items are 4,570 cu. yds. concrete; Lump sum—Installing three 50,000 horsepower hydraulic turbines; 440,000 pounds, furnishing and erecting steel structures; Lump sum—Installing three 47,500 kva, three phase-power transformers; and other work. Completion time 550 days. For particulars, address Bureau of Reclamation, P. O. Box 360, Salt Lake City, Utah; Dutch John, Utah; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5703) will be received at Ogden, Utah, until 10 a.m., Mountain Standard Time, December 19, 1961, for furnishing labor and materials for Earthwork, Pipelines and Structures, Woods Cross Laterals, Part 2, Woods Cross Lateral System, Weber Basin Project, Utah. Location near Ogden, Utah, in Davis County. Principal items are Excavation—52,000 cu. yds.; 62,000 lin. ft. pressure pipe; 35,000 pounds metal pipe and miscellaneous metalwork; and other work. Completion time 650 days. For particulars, address Bureau of Reclamation, P. O. Box 387, Ogden, Utah; P. O. Box 360, Salt Lake City, Utah; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

OFFICIAL PROPOSALS

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CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

INDUS BASIN PROJECT

WATER AND POWER DEVELOPMENT AUTHORITY

ADVANCE NOTICE

OF

INTENT TO INVITE TENDERS

FOR THE

CONSTRUCTION OF CANALS AND APPURTENANT WORKS

The above Authority is undertaking the construction of a number of large canals in West Pakistan. Their construction is being financed through the Indus Basin Development Fund, the operation of which will be administered by the International Bank for Reconstruction and Development (World Bank). The canals which form a part of the works embodied in the Indus Basin Settlement Plan will have a total length of about 390 miles and involve approximately 345 million cubic yards of excavation, as well as the construction of several hundred bridges and other canal structures.

The work will be divided into eight or more individual projects. Prospective contractors invited to tender on the first three canals have either already been prequalified or are being prequalified by action presently under way.

The fourth Link Canal to be undertaken will be the Qadirabad-Balloki Link Canal. This canal will extend from Qadirabad on the Chenab River to Balloki on the Ravi River and have a total length of approximately 78 miles in addition to a feeder canal of about 20 miles. The main canal will have a capacity of 18,600 cubic feet per second for the first 17 miles and 14,500 cubic feet per second thereafter. The feeder canal will have a capacity of 4,100 cubic feet per second. The canals together will involve approximately 93 million cubic yards of excavation, nearly half of which will be wet, and the construction of some 100 structures such as regulators, bridges, aqueducts and siphons.

The next canal to be constructed in the same area will be the Rasul-Qadirabad Link Canal which will extend from Rasul on the Jhelum River to Qadirabad on the Chenab River. This Link will have a capacity of 19,000 cubic feet per second throughout and a length of about 28 miles. Its construction will involve approximately 40 million cubic yards of excavation, over half of which will be wet, and the construction of some 35 structures such as regulators, bridges, aqueducts and siphons.

The Authority plans to call for tenders for the construction of the Qadirabad-Balloki Link in the Spring of 1962 and for the construction of Rasul-Qadirabad Link in the Autumn of 1962. Only contractors who have been prequalified by the Authority will be invited to submit tenders. For this purpose, the Contractors who wish their names to be included on a list to receive the document for prequalification are requested to submit the following information on or before 15 December 1961 to the Authority's Consultants, Tipton and Kalmbach, Inc., at **Post Office Box 589, Lahore, West Pakistan,** with a copy to their office at **831 - 14th Street, Denver 2, Colorado, U.S.A.:**

1. Name of Company or Firm with full address
2. Name and title of person to whom future correspondence should be directed.

The interested contractors will then be furnished with a document describing the work and setting forth the information required from them by the Authority in order to evaluate their qualifications for undertaking the proposed canal construction.

Project Director (Links)

WEST PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY

Bids: December 18, 1961

Invitation for Bids
City of Trenton, Michigan
Sewage Treatment and Refuse System
Contract No. 1

Sealed proposals will be received by the City Clerk of the City of Trenton, Michigan, at his office in the City Hall up to 8:00 o'clock P.M., E.S.T. on December 18, 1961, and then publicly opened at the regular Council meeting on December 18, 1961 at 8:00 o'clock P.M., E.S.T., for the furnishing and erection of certain pieces of equipment as follows:

Division A—Combined Refuse and Sludge Incineration Equipment

Division B—Sludge Drying Equipment

The preliminary drawings and specifications under which the equipment is to be furnished and installed are on file and may be examined at the offices of the City Engineer for the City of Trenton, Michigan, or at the offices of McNamee, Porter and Seeley, 2223 Packard Road, Ann Arbor, Michigan, and copies thereof may be obtained from the latter by making a deposit of Twenty Dollars ($20.00) per set. The full amount of deposit will be returned to bidders for each set of documents upon which a bona fide proposal is submitted. For others, Fifteen Dollars ($15.00) will be refunded for each set returned in good condition and within ten (10) days after the bidding date.

A certified check or bidder's bond for a sum not less than five percent (5%) of the amount of the proposal will be required with each proposal.

The right is reserved by the Owner to accept any proposal, to reject any proposal and to waive irregularities in proposals.

No bid may be withdrawn after the above date and time for receiving bids for a period of forty-five (45) days.

City of Trenton, Michigan
Francis S. Thomas,
City Clerk

CONTRACTORS WATCH THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

District of Columbia—Paving—October 24, 1961. GRADING, DRAINAGE and PAVING, STA. 200+ TO STA. 295+, ANACOSTIA FREEWAY, Federal-Aid Interstate Project No. I-295-2(24)1—Invitation No. C-6255-H, consist. of approx. 22,600 sq. yds. reinf. portland cem. concrete base 8" in depth and 23,640 tons hot asphaltic concrete base course, Class B mixture. Bid forms, plans and specifications are now available from Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $30.00 per set, payable to D. C. Treasurer (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EST, November 28, 1961, in Room 424, 499 Penn. Ave., N.W.

District of Columbia—Bridge Construction—October 30, 1961. 11TH STREET BRIDGE OVER ANACOSTIA RIVER, EAST STRUCTURE—BRIDGE FILE NO. 56, Contract I—RIVER PIERS, FEDERAL AID INTERSTATE PROJECT NO. EI-295-2(26)5, Invitation No. C-6262-H, consisting of 1,871 cu. yds. Class BB concrete in pier shaft and 19,910 cu. ft. Class A stone masonry. Bid forms, plans and specifications are now available from Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $30.00 per set, payable to D. C. Treasurer. (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EST, November 29, 1961, in Room 424, 499 Penn. Ave., N.W.

OFFICIAL PROPOSALS

Bids: November 30, 1961

The International Bridge Authority of Michigan

Advertisement for Proposals

Contract 12—Toll Booths, Canopy, Toll Registering Equipment, Concrete Paving and Islands for U. S. Plaza of the Sault Ste. Marie International Bridge

The International Bridge Authority will receive sealed proposals for the construction of Contract 12—Toll Booths, Canopy, Toll Registering Equipment, Concrete Paving and Islands for U. S. Plaza of the Sault Ste. Marie International Bridge until 10:00 A.M., Eastern Standard Time on the 30th of November 1961, at City Hall, Sault Ste. Marie, Michigan at which time and place proposals will be publicly opened and read aloud.

The work includes the construction of three toll booths and canopy complete with all the required toll collecting equipment. It shall also include the construction of booth islands and concrete paving for the toll booths and inspection booths for the American Plaza of the Sault Ste. Marie International Bridge.

The Principal items of work include:

	Approximate Quantities
Concrete Pavement	265 C.Y.
Concrete Islands & Bumpers	80 C.Y.
Steel Reinforcement	30,640 Lbs.
Toll Booth	3 Ea.
Canopy	L. S.
Toll Registering Equipment	Complete

Plans, Specifications, Proposal Form and Contract Documents for the work are on file in the office of Steinman, Boynton, Gronquist and London, Consulting Engineers, 117 Liberty Street, New York 6, New York and may be inspected by prospective bidders during office hours.

Plans, Specifications, Proposal Form and Contract Documents may be obtained from Steinman, Boynton, Gronquist and London, Consulting Engineers, 117 Liberty Street, New York 6, New York upon application and payment of a fee to Steinman, Boynton, Gronquist and London, of Twenty-five ($25.00) Dollars, Fifteen ($15.00) Dollars of which will be refunded upon return of the Plans to non-bidders, and all of which will be returned to bidders.

Bids must be made upon the proposal form included in the Contract Documents. Each proposal must be accompanied by draft or certified check payable to the order of the International Bridge Authority for the sum of Ten Thousand ($10,000.00) Dollars.

Only United States Contractors may bid on this Contract.

All bidders shall be prequalified.

The right is reserved to reject any or all bids.

THE INTERNATIONAL BRIDGE AUTHORITY OF MICHIGAN
James E. Brophy, Chairman

November 2, 1961

Bids: November 28, 1961

Construction of 16 Inch Diameter Water Supply Mains Arlington County, Virginia

ADVERTISEMENT FOR BIDS

Sealed proposals for furnishing all materials and equipment and doing all work required for the construction of 16-inch diameter water supply mains, as described below, will be received by the Purchasing Agent in Room 213, in the Court House Building at Arlington County, Virginia, until 2:00 P.M., Eastern Standard Time on November 28, 1961 and there publicly opened and read immediately thereafter:

STAGE III
CONTRACT 3
CONSTRUCTION OF 16-INCH DIAMETER WATER SUPPLY MAINS AND APPURTENANCES.

1. Location: The work is located in Arlington County, Virginia, on public streets in Walter Reed Drive, Arlington Mill Drive and Utah Street from N. Glebe Road to South 34th Street.
2. Type of Work: The principal items of work include the following:—Approximately 10,000 linear feet of 16-inch cast iron or prestressed concrete water pipe, together with manholes, miscellaneous gate valves, blow-offs, and connections to existing water mains, etc.
3. Copies of Plans and Specifications, Information for Bidders, Bid forms and other bidding and contract documents may be examined at the office of the Chief Engineer of the Water Division, County Court House, Arlington, Va.; at Dodge Reports, 900 F. Street, N.W., Washington, D. C. and at the office of ALEXANDER POTTER ASSOCIATES, CONSULTING ENGINEERS, 50 CHURCH STREET, NEW YORK 7, N. Y.
4. Copies of Plans, Specifications and Bidding Documents may be obtained from the Purchasing Agent in Room 213, Court House Building at Arlington, Virginia upon deposit of THIRTY ($30.00) DOLLARS PER SET.

Full refund will be made to actual bidders for return of one (1) Set, in good condition, within two weeks after closing date for receipt of bids; refund for return of all other sets, in good condition, WITHIN THE SAME PERIOD, will be Fifty (50%) percent of the deposit. No refund will be made for return of documents in poor condition or later than the two week period stipulated.

All bids must be on the form contained in the Contract and Specifications.

Contractors, whether resident or non-resident in Virginia will be required to show evidence of a certificate of registration as required by Chapter 7 of Title 54 of the Code of Virginia before their bids will be considered, if the bid is $20,000 or more.

All bids must be accompanied by a certified check or acceptable bidder's bond in an amount of not less than Five Per Cent (5%) of the amount of the bid, made payable to the Treasurer of Arlington County, as bid security.

The successful bidder will be required to furnish a Performance Bond conditioned upon the faithful performance of the Contract and upon payment of all persons supplying labor and furnishing materials on the construction of the work.

No bidder may withdraw his bid within Thirty (30) days after actual date of opening thereof.

The County Board of Arlington County, Virginia, reserves the right to reject any or all bids and to waive any informality in the bids.

ARLINGTON COUNTY, VIRGINIA
By: H. G. Bonney
Purchasing Agent

Engineering News-Record

Reaches Your Local Contractors

Its distribution among the contractors of any one state is in proportion to the number of contractors situated in that state. The Official Proposal Columns of *Engineering News-Record* offer precisely the same efficient service to municipalities, counties, state and federal departments in every section of the United States.

OFFICIAL PROPOSALS

Notice to Building Foundation Contractors

Sealed proposals, in envelopes plainly marked Proposal for Prequalification for Foundation Work, addressed to Niran C. Bates, Director, Bureau of Public Improvements, will be received in Room 115, State Office Building, Augusta, Maine, at 9:30 A.M.—E.S.T. on November 29, 1961.

The Bureau of Public Improvements wishes to prequalify bidders for foundation work requiring the underpinning of several columns and sections of brick walls in the State House, Augusta, Maine. Portions of the work may be required to be done during hours when the building is not open for normal business.

Prospective bidders are invited to submit their qualifications, citing simliar contracts that have been successfully completed.

STATE OF MAINE
NIRAN C. BATES, DIRECTOR
BUREAU OF
PUBLIC IMPROVEMENTS

Bids: December 7, 1961

The Port of New York Authority New York International Airport

WATER TANK,
OBSTRUCTION MARKINGS
CONTRACT NYA-920.015

Sealed proposals for electrical installations on and painting exterior surfaces of the Jamaica Water Supply Co. elevated water tank No. 20, located at Miriam Parkway and Lenox Street, Elmont, Town of Hempstead, Nassau County, New York will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Thursday, December 7, 1961, at which time said proposals will be opened and read in Room No. 1108.

Contract Documents may be seen at the office of the Assistant Chief Engineer for Design of the Authority, Room 1115, and copies will be furnished upon request. No deposit will be required but the documents shall be returned in good condition not later than forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, November 16, 1961

NOTICE to ADVERTISERS

Because of the Holiday, Thanksgiving Day, November 23rd, the "Searchlight" pages of the

November 30th Issue of

ENGINEERING NEWS-RECORD

Close for press earlier than the usual weekly closing time

The cooperation of advertisers is solicited in forwarding new copy, or changes in copy, to reach us accordingly.

Display and Undisplayed Ads

FINAL CLOSING TIME

Friday, November 17th

PROPOSALS

Friday, November 24th

EMPLOYMENT OPPORTUNITIES

DISPLAYED RATE:

The advertising rate is $45.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

NOVEMBER 30TH ISSUE CLOSES NOVEMBER 17TH

UNDISPLAYED RATE:

$2.70 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 645 N. Michigan Ave.
SAN FRANCISCO 11: 255 California St.

• POSITIONS VACANT

Electric Systems Engineer—Midwestern consulting engineerin firm has challenging opportunity in electric systems planning. Work includes network analyzer, sectionalizing and economic feasibility studies. Permanent employment offered to man with 3 to 5 years experience. Submit resume and salary requirements to Stanley Engineering Company, Muscatine, Iowa.

Field Engineer — Permanent position with established Midwest consulting firm for man thoroughly qualified and experienced in all branches of building construction. Moving expenses paid. Electrical or process engineer preferred. Send complete resume to P-7633, Engineering News-Record.

Process Piping Engineer for full or part time work. Telephone—CO 2-5005 Paramus, New Jersey.

Guard Rail Superintendent. Must be familiar with all phases of guard rail construction and be able to procure and train capable foremen and operators. Send complete resume including salary requirements to P-7614, Engineering News-Record.

Water Works Engineer—Graduate with degree in Sanitary Engineering, or Chemistry, for water works management company; 5-10 years experience in investigation, design and supervision of purification facilities. Location: Philadelphia, Pa.; some travel. P-7700, Engineering News-Record.

Highway Engineers and Structural Designers. Experienced. Send resume and salary requirements. Frederic A. Nassaux & Assoc., 312 Trust Bldg., Chambersburg, Penns.

Draftsmen. Structural-Experienced checkers and detailers of structural steel shop dwgs. Relocation expenses. Fink and Zwecker Co., 1100 Crescent Ave., N.E., Atlanta 9, Ga.

Civils—Water Resources Planning, domestic and foreign opportunities with expanding consulting firm for irrigation and hydroelectric engineers and hydrologist, minimum 5 years experience. Send resume and salary desired. P-7732, Engineering News-Record.

General Superintendent for established General Contractor in highway and heavy construction. Doing a volume of approximately $10,000,000.00 per year. Ohio and Kentucky area. Excellent opportunity for man with previous experience as General Superintendent or as Superintendent with responsible charge of highway and heavy construction projects. Must be fully qualified including formal training and experience in supervision, planning and control of highway and heavy construction jobs. P-7743, Engineering News-Record.

C.P.A.—Years of experience in construction and taxes. Must be top man for top, steady position. P-7712, Engineering News-Record.

Structural Engineer—Architectural, Civil, or Mechanical Engineer interested in conducting research on uses of light-gage steel in commercial and residential structures and associated building applications. Work involves development of program, design, analysis, production techniques and performance testing. Large Research Laboratory, Pittsburgh, Pennsylvania. Background in research or product development desirable. M.S. or B.S. degree required. Submit resume and salary requirements to P-7768, Engineering News-Record.

• POSITIONS VACANT

Mechanical Superintendent experienced in water and sewage treatment plant installations Eastern United States with 50 year old firm. Reply P-7779, Engineering News-Record.

Structural engineer (P.E.). Min. 5 yrs. experience designing building frames and foundations. Send resume, salary expected, references, availability to Snyder & Troxel, Consulting Engineers, 300 Denison Bldg., Syracuse, N. Y.

Mechanical Engineer (Civil Service Classification Mechanical Engineer II) Monthly Salary Range $594 to $725. Job Requirements: Makes studies, plans, estimates, tests and writes specifications for a wide variety of mechanical engineering work, such as diesel, steam and internal combustion power units and pumps with their respective auxiliaries and other related equipment used in both water and sewage treatment plants. Age, Education and Experience Requirements: Not over 55 years of age; must have B.S. degree in Mechanical Engineering plus five (5) years experience in the design, installation, operation, and maintenance of large scale mechanical engineering projects; or the equivalent combination of related education and experience. Please send a complete summary of your education and experience, including a transcript of your college credits and a photostatic copy of your military service discharge record for veteran's preference points to Henry W. Korner, Executive Secretary, City of Miami Civil Service Board, 3318 Pan American Drive, Miami 33, Florida. The closing date for receiving applications for the position is Dec. 15, 1961 and all qualified applicants will be given a written examination either in or near their present place of residence shortly after that date.

Graduate Civil Engineer to learn Prestressed Concrete Fabrication. Recent graduate will be considered. Moving expenses paid to relocate in central Wisconsin. Opportunity involves layout, design of shop drawings, some jobsite work, estimating and quantity take off and field sketches. Good possibility to grow with company. Reply to P-7723, Engineering News-Record, with resume of education and experience.

Civil Engineer, specialist in hot-mix asphalt paving practice—mix design, control at plant and field. Please give full details. Salary open. Permanent. P-7660, Engineering News-Record.

Draftsman—experienced reinforcing bar detailer and checker. Permanent position with established steel producer. Submit resume of experience, references, and salary expected. All replies confidential. P-7811, Engineering News-Record.

Senior Engineer for general municipal work. Starting salary $6750 with 5 yearly increments to $8250. Must have degree in Civil Engineering. Send summary of experience to City Manager, City Hall, Watertown, New York.

Maryland—New opportunity on the Chesapeake for a Hydrographic Engineer I. Requires degree in engineering and four years experience in hydrographic and land survey work. Salary: $6280-$7849 (maximum in six years.) Write: Professional Recruitment, Commissioner of Personnel, 301 W. Preston Street, Baltimore 1, Maryland.

Wanted—Experienced, competent engineers to design water works, sewers, water and sewage treatment plants. State age, education, experience, salary expected, when will report. Correspondence confidential. P-7816, Engineering News-Record.

Soil Engineers—Recent graduates or experienced. Permanent positions with small consulting firm. SM Engineering Services, Inc., Box 424 Summit, New Jersey.

• POSITIONS VACANT

Wanted—Civil Engineer—Experienced in subdivision calculations, design of streets, water and sewer systems, storm drains, etc. Send resume and salary requirements to Ralph L. Kraemer, Western Engineers, Inc., Las Vegas, Nevada.

Assistant City Engineer, Meadville, Pennsylvania. Duties: Assist City Engineer in all phases of public works administration including sewage treatement, water supply, sanitary landfill operation, construction and repairs of streets and sewers, snow removal, building inspection, and city planning. Opportunity for varied experience and to become superintendent of Water Department and Sewage Treatment Plant in a clean, college town with a history of good government. Requirements: B.S. degree in Civil or Sanitary Engineering and some experience in related field. Salary: $6,000-$6,500. Reply to: City Engineer, City Hall, Meadville, Pa.

Young Engineers Publicly-owned housing firm in West seeks well-educated young men for its contract work. Excellent opportunity for advancement. Send complete resume to P-7814, Engineering News-Record.

Structural Engineer. Bridges, Industrial Bldgs, and other heavy Civil Engineering. Good engineering background. Must have talent for difficult design and willingness to perform all assignments in moderate size office. Excellent opportunity, Upstate New York, consultant, send complete resume. All correspondence acknowledged. P-7791, Engineering News-Record.

Construction Executive — Well-established Midwestern heavy construction firm has an exceptional opportunity for an aggressive, ambitious, competent General Manager. Must have record of accomplishment in job execution in all phases of heavy construction, such as highways, bridges, airports, structures, etc., and thorough background in contracts administration and estimating. Send completely detailed resume of work experience, age, references, salary requirements, etc. P-7797, Engineering News-Record.

Reg. P.E. (2) experienced designers highway roadways and/or bridges. Send resume, salary expected. Established firm, southwest. P-7804, Engineering News-Record.

Project Administrator Publicly-owned housing firm in West seeks young well-educated, experienced engineer for its contract work. Excellent compensation with opportunity for advacement. Send complete resume to P-7815, Engineering News-Record.

Engineer (Parks) Dept. of Conservation. Albany, N. Y. $7360-$8910. Immediate appointment. Civil Service examination to be held at a later date. New York State residence not required. Requires either a Bachelor's degree in engineering, architecture or landscape architecture and 2 yrs. of experience, one of which must have been in the design and construction of parks and parkways; or six years of experience in design and construction of parks and parkways; or any equivalent combination of training and experience. Send resumes to Recruitment Unit, Box 41A, Civil Service Dept., State Campus, Albany, 1, N. Y.

City Engineer—Wanted by the City of Owosso, population 17,000. Must be registered professional engineer with previous experience in municipal engineering desired. Must be capable of handling both field and office work in connection with design and construction of sewers, watermains, and street paving, etc. Salary open. Send application and resume showing personal data, education, and experience to Commissioner of Public Improvements, City Hall, Owosso, Michigan.

Construction Supt. — Opportunity, incentive with established General Contractor. Send resume to K. F. Sullivan Co., Box 813, Madison, Wis.

Natural Resources Coordinator — Organize, administer and coordinate county conservation programs. Salary $831-$1,038. Requires college graduation plus 6 years of either professional engineering experience or work in a conservation program involving considerable public contact. Note: At least 3 years of the experience must have been in an administrative, supervisory, or public relations function of a natural resources conservation program. Apply immediately to: Edward W. Firby, Director of Personnel, Room 101, Hall of Records, Fresno 21, California.

• EMPLOYMENT SERVICES

Want higher salary? 200-1,000 new positions reported monthly. Get free copy. Strict confidence. National Employment Reports, 105 W. Adams, 830-B, Chicago 3.

(Continued on opposite page)

City Planners
AND
Highway Engineers

Field & Office
Survey Personnel

Salary commensurate with ability.

Openings at Rochester, Pennsylvania and Jackson, Mississippi

Interested Personnel Mail Resume To

PERSONNEL DEPARTMENT
MICHAEL BAKER, JR., INC.
Consulting Engineers
Rochester, Pennsylvania
or
NORTHSIDE STATION
P.O. Box 9997 Jackson, Mississippi

CHIEF ENGINEER

Chief Engineer for foreign office. Applicant must have successful record in directing the planning, design and engineering supervision of construction of large multi-purpose dams and irrigation works. Executive capability required to direct large staff and conduct effective cooperation of several technical agencies. Submit complete resume and references to Personnel Manager.

HARZA ENGINEERING COMPANY
400 West Madison Street Chicago 6, Illinois

CONSTRUCTION BUYER

with estimating experience needed by well-established Chicago contracting company engaged in competitive highway program. Assignment calls for Civil or Structural Engineer with heavy background in both estimating & procurement. Age not a factor but candidates must demonstrate managerial potential. Salary $15,000. Write:

King Whitney, Jr.
THE PERSONNEL LABORATORY, INC.
500 Summer St., Rm 201, Stamford, Conn.

ENGINEERS WANTED
MECHANICAL-CIVIL

SALARY OPEN

SEND RESUME INCLUDING EDUCATION AND EXPERIENCE TO:
P.O. BOX 665
HARRISBURG, PA.

★ *Expanded West Virginia Road Program Offers Opportunities for EXPERIENCED ENGINEERS*

Highway Design and Construction—Soils—Materials Testing—Urban Planning—Bridge Design

★ *YOUR RESUME HELD IN STRICT CONFIDENCE* ★

Starting Salaries From: $6,000 to $10,000

Retirement, vacation and sick leave benefits. Reply with resume for possible interview to: N. W. Goodman, P.E., West Virginia State Road Commission, Charleston, West. Va.

WEST VIRGINIA
State Road Commission
Charleston, West Virginia

ALASKA OPENING
Assistant State Materials Engineer

Division of Highways, STATE OF ALASKA. Highway Engineer III. $12,000-$14,000. Registered professional engineer—Nine years of experience, three years supervisory in Materials testing, preferably in a State Highway organization. Retirement, annual and sick leave benefits—Group Health Insurance—Civil Service. Write:

DIRECTOR OF HIGHWAYS
Box 1841 Juneau, Alaska

REGIONAL SALES MANAGER

Large industrial manufacturer requires a top level sales manager to direct the activities of approximately 25 sales representatives in a large midwest territory. Specific responsibilities include the definition of territories and objectives, the training of salesmen, the determination and control of selling expense. A college degree, preferably in engineering, is required. Prior sales administration experience in the mining, construction or explosives field, is a must.

The starting salary, based upon experience, will be in the $12,000 to $16,000 range. The fee and the expense of relocation will be borne by our client.

NEW DIRECTIONS
PERSONNEL AGENCY, INC.
369 Lexington Avenue, New York 17, N. Y.

DRAFTSMEN and DESIGNERS
For Bridge and Highway Projects

Send resume, references and salary requirements. Draftsmen include samples of recent work.

BROOKHART & TYO
3501 N. Front St. Harrisburg, Pa.

ENGINEER SANITARY

5 years design experience sanitary and civil. Project engineer with San Francisco area consulting firm under chief engineer. Salary open. Resume to

P-7770, Engineering News-Record
255 California St., San Francisco 11, Calif.

N. Y. Electrical Construction firm of long standing temporarily crippled, making plans to reorganize. Seeking Electrical Engineers or Estimators that have sufficient confidence in their ability to invest money and participate in management and profits. Wonderful opportunity.

P-7762, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

• *POSITIONS WANTED*

(Continued from opposite page)

Construction Supt. Heavy Construction. PW-4482, Engineering News-Record.

Sales Engineer — Mechanical Engineering graduate, over ten years experience managing, selling, designing, estimating, executing industrial insulation contracts. Desire to change firm going into new or related field. PW-7734, Engineering News-Record.

Project-Manager Entire Supervision All branches of hvy const., estimates & methods, 22 yrs. exp. major projects U.S. & O.S. PW-7665, Engineering News-Record.

Layout Eng. or party chief-clerk of works, diversified expr., will travel, location immaterial—single. PO Box 949, Hollywood, Fla.

Structural Designer: Experienced in heavy steel and concrete structures as railroad, petroleum refineries, copper mine, and railroad bridges. Some highway bridge work. Graduate engr. Prefer So. Cal. or Gulf States. Consider other. PW-7692, Engineering News-Record.

Chief Estimator, graduate civil engineer, 38. Excellent field experience from field engineer to project manager. PW-7715, Engineering News-Record.

Mechanic—Age 25—10 years experience on Allis Chalmers, Caterpillar, G.M. Diesel and Welding experience. PO Box 165, Bergen, N. Y.

B.S.C.E., P.E., 33. 6 yrs. exp. sewers, hwys, insp. West, Southwest area. PW-7752, Engineering News-Record.

Construction Manager: Excellent and extensive background. Fully qualified all phases building construction. Estimating, purchasing, contract negotiation, field staffing and supervision. Good organizational and administrative ability. Age 45. Full resume and references available. PW-7766, Engineering News-Record.

• *POSITIONS WANTED*

Structural Engineer—Desires relocation in South Florida area. Graduate architect and mechanical engineer with 10 years experience in design field. Major experience in structural field with architectural-engineering firm. Experience in land planning and related civil engineering. Florida engr. regist. Resume on request. PW-7760, Engineering News-Record.

Construction Engineer B.S.C.E. 22 yrs. supervision, engineering, design, specifications-highways, airports, marine structures, p.o.l. installations, power plants, water and sewage works, including mechanical and electrical. Fluent French, Spanish and Italian. Age 56. Now in Far East. Available Feb. 1. Write P.O. Box 413, Huntington, New York.

Mechanical Engineer. 10 years machine de-sign principally hydroelectric machinery, cranes, hoists. Desire position with manufacturer or utility leading to management. Resume furnished to explicit responses. PW-7780, Engineering News-Record.

General Supt., Proj. Mgr. Hvy. Const. roads, bldgs, bridges, flood control, tunnels, pipelines, sewage disp. Civil, Mech. PW-7787, Engineering News-Record.

Executive, 17 yrs const exp, efficient ad-ministrator mgr acct atty, employed. PW-7808, Engineering News-Record.

B.S.C.E., 28, 6 years varied domestic and foreign construction experience with some estimating and design work, desires position with contractor or consultant anywhere. Good resume PW-7820, Engineering News-Record.

Field Inspector—Liaison—15 yrs exper. on inspection and testing of equip. and material for chem-power-missile projects both abroad and U.S. PW-7809, Engineering News-Record.

Draftsman, 27, 6 yrs. exp. in Stl. Structures, piping, and misc. 3 yrs. in European Structural Design Course. Employed with U.S. firm in West Indies. Will arrive New York Nov. 16. Desires interesting employment East Coast. PW-7800, Engineering News-Record.

SEARCHLIGHT SECTION

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The advertising rate is $25.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vert. on one col., 3 columns—30 in. to a page.
EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

NOVEMBER 30TH ISSUE CLOSES NOVEMBER 17TH

UNDISPLAYED RATES

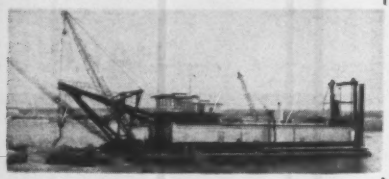
$2.70 a line, min. 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count as one additional line in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

FOR SALE—HEAVY DUTY 16" DREDGE

4 years old
Enterprise Diesel 1050-hp on main pump
350-Kw main Generator plus two auxiliaries
55' Ladder—Anchor Booms



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SEWARD DREDGING COMPANY, INC.
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WELDING AND CUTTING OUTFITS — $79.50

COMPLETE - BRAND NEW OUTFIT CONSISTS OF
1—Heavy Duty Welding Torch with 3 Welding Tips.
1—Heavy Duty Cutting Attachment with 1 Cutting Tip.
1—Oxygen Regulator with Gauges.
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12½ Ft. 3/16 Twin Hose with Connections.
1—Torch Lighter.
1—Pair Goggles.
1—Torch Wrench.
Terms—Certified Check With Order Plus $2.00 Postage.

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404 Davenport St. Saginaw, Michigan

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Portable, Stationary, Mobile—Purchased - Sold - Rented

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10" x 24" RB Jaw Crusher, 24" x 16" RB Roll Crusher, 30" x 8' 3½-Deck Screen, GMC diesel, pneumatic tires, excellent condition. New 1952.

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9BV converted to larger 6-110 GM diesel and extended conveyor. Very good. Offered subject to prior sale or disposition

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FS-7810, Engineering News-Record
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Dept. ENR-11161 Simpson, Pa.

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• SPECIAL SERVICE

Professional Engineer with background of experience in Latin America will shortly, after January first, make an exploratory trip to those countries in behalf of an American Engineering and Construction Company. Will also be available during this trip for assignment of like nature for other clients desiring such a report or survey. If interested address SS-7807, Engineering News-Record.

EQUIPMENT WANTED

75 to 100 HP Builders
GAS-DRIVEN HOIST.
Late Model—State Price and Make.
W-7818, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

• BUSINESS OPPORTUNITIES

Engineer—Civil, Registered N.Y. to form partnership. No investment required. BO-7805, Engineering News-Record.

General Contractor, Michigan and Ohio, two million contracts. Will sell or merge. 1961 tax loss. BO-7790, Engineering News-Record.

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IN STOCK—DISMANTLED

TEMPORARY BRIDGE BEAMS

HEAVY—LONG OR SHORT SPANS
LEOPOLD COHEN IRON CO.
3000 S. KEDZIE CHICAGO 23, ILL. BI 7-6336

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Various Makes
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Fully equipped modern shops — all makes and models repaired — all work guaranteed — prompt service — complete line field supplies.

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Established 1914.
210 S. Canal St. Chicago (6), Ill.

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D-9 **CATERPILLAR** Tractor
Double Drum PCU—9-S Blade
Undercarriage Rebuilt

3 **KOEHRING** WD-60 Dumptors
GM Diesel Power—8 Ton Cap.
Good Condition

2 **LORAIN** ML-309 Loaders
3 yd. Buckets—Cummins Diesel
New This Year

L. B. SMITH, INC.
Court Street Road
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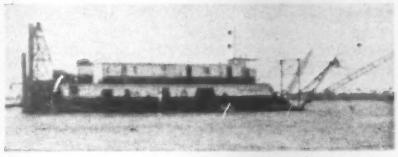

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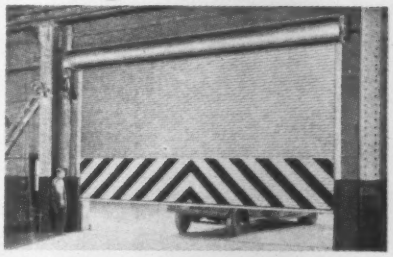

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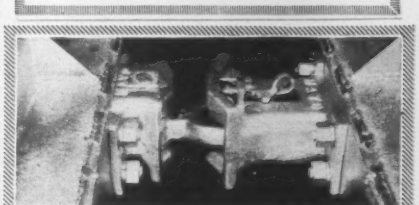

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For more than 30 years, we have started, stuttered, sputtered and backed off from completing this vital route. As a result, not only is the highway not finished, but some sections that have been opened to traffic have fallen into disrepair. At present the road is perhaps 50% functionally complete, despite a U.S. investment that already totals some $168 million, including a $30-million military expenditure during World War II.

We, in partnership with the countries involved, can finish the job by the immediate expenditure of $55 million, according to a recent authoritative estimate by the International Road Federation. This amount in U.S. funds would be matched on a 1-to-2 basis by each of the national governments involved (see p. 21).

Before appropriating the money to complete the road, however, U.S. legislators should make certain that one major hurdle is overcome. That hurdle is the inability of some of these countries to maintain the road adequately after it is finished. Lack of adequate maintenance in the past has accelerated deterioration of the road in some locations.

This problem can be solved by close cooperation among the six countries, with U.S. support. Some time ago there was proposed the formation of the Inter-American Highway Agency (IAHA), whose sole purpose would be to maintain the road by pooling of funds, equipment and other resources in a cooperative effort transcending national boundaries. Formation of such a group is both practical and necessary.

It is believed that IAHA would need to function for from 6 to 10 years, or until the various national economies became strong enough to permit maintenance of each section on a national basis. IRF estimates that $16 million in maintenance funds would be necessary during the first six years.

If the road is left uncompleted or allowed to fall into disrepair, there will be an inevitable drop in U.S. prestige in this critical area. At least some Latin American leaders will feel that we have failed to meet our obligations, moral and otherwise.

More important, a good, well maintained Inter-American Highway is essential to continued economic development in each of the six countries. For in each case, the road forms the backbone of a developing system of farm-to-market and feeder roads.

For these reasons, two major steps should be taken as soon as possible. Congress should provide the U.S. share of funds to complete the road; if necessary, such funds should be included in the regular foreign-aid program. At the same time and as a prerequisite to Congressional action, an effective international agency should be formed to maintain the road.

Your Child and Construction

A CAREER IN CONSTRUCTION, what it offers and what it demands, is splendidly presented in an advertisement of the New York Life Insurance Co. currently appearing in some of the general circulation magazines. It is one of a series on careers, promoting the company's college education insurance by alerting parents to the futures available to their children in various fields. This latest on construction is a boon to an industry that needs a continuous flow of new recruits—contractors, engineers, architects, craftsmen, ad infinitum—and has ample rewards to offer them.

"Should Your Child Go Into the Construction Business?" the ad asks. The answer, given by Allen D. Christensen, former president of the Utah Construction and Mining Co. and one of this generation's great constructors, is realistic, informative and convincing. Construction is a good business for children to aspire to. Few careers offer a greater feeling of achievement, says Mr. Christensen. And this is, indeed, construction's great appeal.

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In construction you can develop your own small business and have many chances to make it big, or you can work for someone else. You can work in the wilderness at home or abroad, or confine yourself to the city. The varied, exciting, satisfying and altogether rewarding careers in construction are worth every parent's attention. And if Junior sees more appeal in a trip to the Moon, he can plan for that, too, for construction men will be as necessary in space as they are on the ground.

New York Life and Mr. Christensen have done a good deed for the construction industry and for parents, too. For the nation depends on construction, and construction depends on the nation's youth.

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